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OPILIONES OF THE FAMILY PHALANGODIDAE FOUND IN COSTA RICA

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ABSTRACT

Members of the opiliones family, Phalangodidae, found in Costa Rica are considered here. Previously described species were examined. Two new genera, *Costabrimma* and *Neocynorta* are defined. Species described include: *Costabrimma cruzensis*, n. sp., *C. nicoyensis*, n. sp., *C. terrena*, n. sp.; *Dapessus tarsalis* (Banks), *D. albitrochanteris* (Roewer), *D. atroluteus* (Roewer), *D. brevis* (Roewer), *D. foliatus*, n. sp., *D. gracilipes* (Roewer), *D. llorensis*, n. sp., *D. parallelus* (Goodnight and Goodnight), *D. tenuis* (Roewer), *D. trochantericus* (Roewer), *D. vitensis*, n. sp., *D. zalmoxiformis* (Roewer); *Neocynortina dixoni*, n. sp., *Pachylicus rugosus* (Banks), *P. cotoensis*, n. sp., *P. foveolatus*, n. sp., *P. hirsutus* Roewer, *P. hispidus*, n. sp., *P. spinatus*, n. sp.; *Panopiliops reimoseri* (Roewer), *P. inops*, n. sp.; *Phalangoduna granosa* Roewer; *Stygnoleptes analis* Banks; *Stygnomma fuhrmanni* Roewer and *Pellobunus insularis* Banks. All species with the exception of *Pellobunus insularis* are members of the subfamily Phalangodinae; *P. insularis* is regarded as a member of the subfamily Samoninae. All species are illustrated; keys are provided for the identification of males to most genera.

INTRODUCTION

Costa Rica, located as it is in Central America, represents an interesting area for the study of the distribution of tropical faunas. The country has an enormous variety of habitats varying from high mountains to coastal areas and from dry to moist conditions. It is an integral part of the area that formed a passage from South America to North America, possibly during Upper Cretaceous times and certainly during the Jurassic. This unique situation has made possible a fauna with at least three elements: that is, species representing invasions from South America, indigenous forms, and forms related to or derived from more northern areas.

The study of the opilionids, particularly of the phalangodids of this interesting country has not been extensive. Pickard-Cambridge (1905) did describe some opilionids from Costa Rica, but no phalangodids were included in his studies. Banks in short papers published in 1905, 1909 and 1914 described a few species. Roewer (1923) listed these forms and later (1933) listed 37 species as being from Costa Rica. In 1949 he described several more species. Of these descriptions, only a relatively few were members of the family Phalangodidae. Other workers who have described a few forms from Costa Rica include Soerensen (1932), Chamberlin (1925) and Petrunkevitch (1925). As can be easily observed, there has been no attempt to bring the information together in a single publication for easier access.

This paper is concerned with the opilionids of the family Phalangodidae which we have found to occur in Costa Rica. As was to be expected, the three types of species, as mentioned above, were encountered; members of the genus *Dapessus (= Cynortina)* represent a widespread genus which is found in much of Central America, probably representing forms originating north of Costa Rica. *Stygnomma fuhrmanni* Roewer represents a northern record for a species originally described from Venezuela. Of the indigenous genera, *Costabrimma* probably is the most representative.

Most of the material studied was collected by ourselves and our son, Charles, during the summers of 1976 and 1978. Unless otherwise noted, the collections cited were made by at least one of us. Charles Goodnight, alone, was responsible for the collections from the Osa Peninsula. During our two visits to Costa Rica, we attempted to visit as many different areas as possible in order to have an adequate representation of the fauna.

Collections were done by means of Berlese funnels, sifting of debris and by careful observation of overturned logs and rocks. Animals were preserved in 95% alcohol. Genitalia were mounted on slides in Turtox CM CP-9AB and observed under a compound microscope.

Whenever possible, the locality records include the name of the province in which the collection was made. Inasmuch as many of the locality records of Roewer's specimens did not indicate with any degree of exactitude where the collection took place, the record is incomplete. Every attempt was made to determine the exact locale, but many were not listed on the maps available to us. Such is also the case with Soerensen's record.

It will be noted that some of the synomonies are quite extensive. This is due to the fact that several of the species are quite variable and were unwittingly described several times by different investigators. Also Dr. Roewer, though he was usually correct in his diagnosis of new species, tended to regard each individual as a separate genus and species. This has unfortunately lead to several errors, not only on his part, but on that of ourselves and other workers. We hope that we have at least partially corrected some of the problems arising from this.

We have attempted to describe only forms of which we had both males and females. Only in one case, *Panopiliops inops*, did we set up a species based only on a female. This particular form is blind and quite unlike any other species; presumably the male would be easily recognized. In three cases [*Dapessus brevis* (Roewer), *Dapessus tenuis* (Roewer), and *Dapessus trochantericus* (Roewer)] we had only females available for study; thus the descriptions are not nearly so adequate as we would desire.

Holotypes and most paratypes of new species as well as identified forms of most species are deposited in the collections of the American Museum of Natural History, New York. We have retained a few paratypes for our own collection.

SYSTEMATICS

PHALANGODINAE ROEWER

Key for Identification of Genera, based on males

1. Tarsus I with four or more segments 6
   Tarsus I with three segments 2

2. Tarsal segments numbering 3-5-5-5, or 3-5-5-6, eye tubercle in the form of a forward pointing cone, often with tubercles. . . . . .*Costabrimma*

Tarsal segments somewhat more variable in number, eye tubercle with spine, low and oval in shape, or in form of low cone. 3

3. Eye tubercle removed from anterior margin of cephalothorax, a low cone; male penis not sclerotized shaft, animal less than 2 millimeters in length. . . . . *Neocynortina*
Eye tubercle unlike above, low and oval, or with spine 4

4. Eye tubercle with dorsal, forward pointing spine . . . . . *Pachylicus*
Eye tubercle without spine 5

5. Secondary sexual characters usually in form of enlarged tarsal segments; tarsal segments varying in number, 3-6 or more than 6-4 or 5, 6 . . . . . *Dapessus*
Secondary sexual characters in the form of spines on leg IV and usual presence of large spine on anal operculum; tarsal segments variable in number: 3-6-4-5, 3-6-5-5, or 3-5-4-5 . . . . . *Stygnoleptes*

6. Eyes present, but not on tubercle, usually directly on cephalothorax. . . . *Stygnomma*
Eye tubercle present 7
7. Eye tubercle prolonged into a prominent spine . . . . . *Panopiliops*
Eye tubercle rounded. 8

8. Eye tubercle rounded, usually removed from the anterior margin of the cephalothorax. . . . . *Pellobunus*
Eye tubercle rounded, on anterior margin of cephalothorax. . . . . *Phalangoduna*

Costabrimma, new genus

Type species.—*Costabrimma cruzensis*, new species.

Diagnosis.—Very small forms, eye tubercle on or very close to the anterior margin of the cephalothorax, in the shape of a forward pointing cone. Five dorsal areas present, first without a median line, posterior margins parallel. Legs usually quite short; metatarsi without astraguli or calcanei. Tarsal segments 3-5-5-5 or 3-5-5-6, distitarsus of first tarsus with two segments, second with three. Double claws of tarsi III and IV simple, arising independently. Penis a sclerotized shaft; ovipositor usually bluntly rounded, with numerous setae. Secondary sexual characters variable, usually in the form of leg modifications.

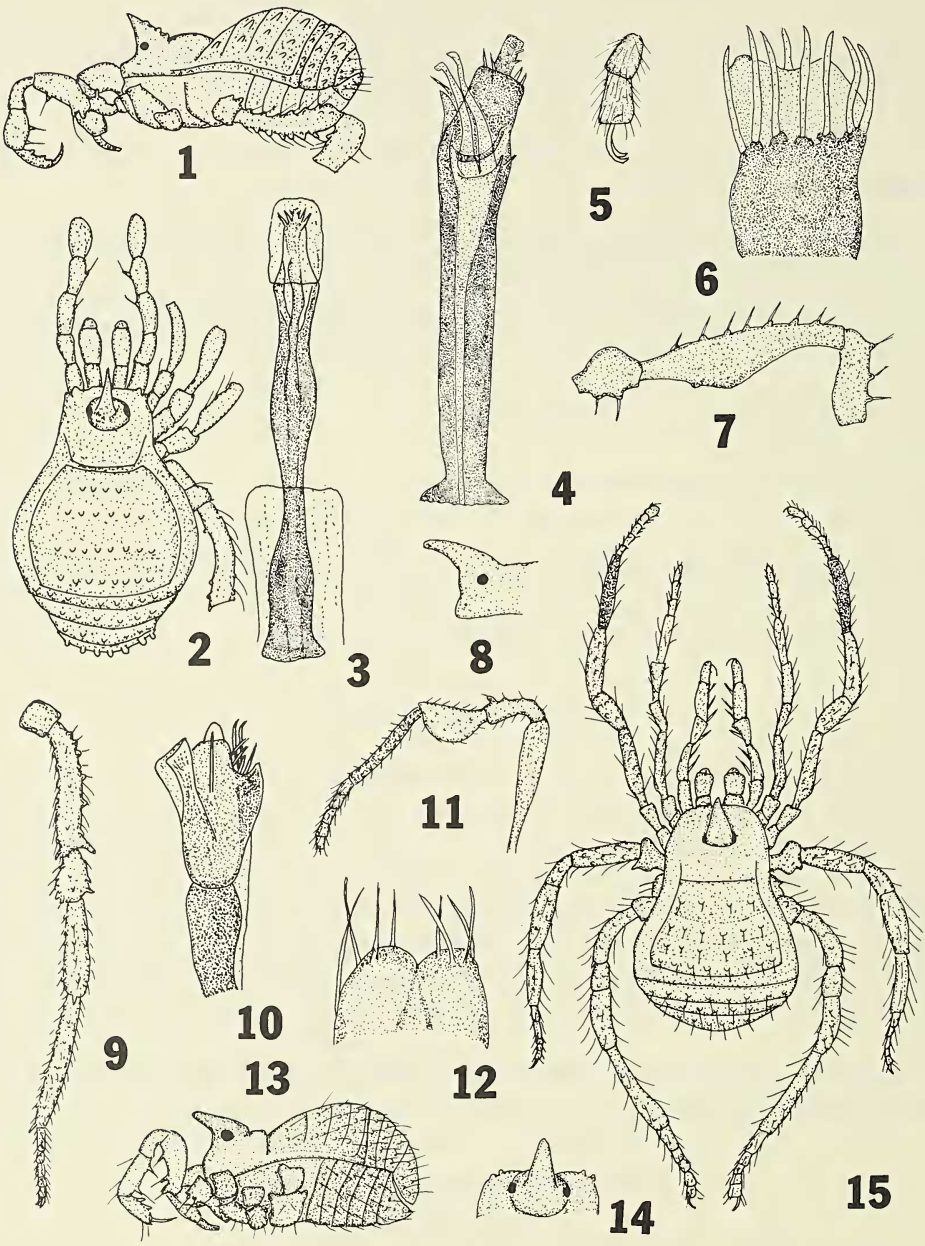
Remarks.—The unusual eye tubercle and the number of tarsal segments distinguish this group from other genera.

Costabrimma cruzensis, new species

Figs. 1-7

Description of male holotype.—Total length of body, 2.9 mm; cephalothorax, 0.9 mm; width of body at widest portion, 1.9 mm. Length of Legs (I-II-III-IV in mm): Trochanter 0.2-0.3-0.2-0.4; Femur 0.9-1.0-0.9-1.1; Patella 0.4-0.4-0.3-0.5; Tibia 0.6-0.8-0.9-1.1; Metatarsus 0.8-0.8-0.9-1.1; Tarsus 0.8-1.1-0.8-1.2; Total 3.7-4.4-3.9-5.3.

Anterior margin of cephalothorax with two blunt spines on either side. Eye tubercle nearly on the anterior margin, in the form of a forward pointing cone, with several tubercles on the posterior portion, surface otherwise smooth. Each dorsal area with a transverse row of low tubercles, those of the fifth area somewhat larger. Anal operculum



Figs. 1-7.–*Costabrimma cruzensis*, new species: 1, lateral view of male; 2, dorsal view of male; 3, ventral view of penis; 4, lateral view of penis; 5, distal segments of tarsus IV of male; 6, dorsal view of distal portion of ovipositor; 7, trochanter, femur, and patella of leg II of male.

Figs. 8-15.–*Costabrimma nicoyensis*, new species: 8, lateral view of eye tubercle of male; 9, lateral view of leg IV of male; 10, lateral view of distal tip of penis; 11, lateral view of leg II of male; 12, dorsal view of distal tip of ovipositor; 13, lateral view of male; 14, dorsal view of eye tubercle of male; 15, dorsal view of male.

with similar tubercles. Spiracle partially concealed by small spines from the posterior portion of coxae IV. Coxae of legs and palpi with numerous low tuberculations, which are larger on the anterior surfaces of coxae IV. Free sternites each with a transverse row of low tubercles.

Penis a sclerotized shaft as illustrated.

Palpus: trochanter 0.3 mm long; femur, 0.5; patella, 0.3; tibia, 0.4; and tarsus, 0.4. Total length, 1.9 mm. Palpal femur and patella each with an anterior-median spine. Chelicerae not enlarged.

All segments of legs with investing hairs, low tuberculations present on all segments but the tarsi. Femur II with a proximal enlargement as illustrated, no special structural details were observed. Femur IV slightly curved. Tarsal segments 3-5-5-5.

Color a uniform yellow brown, all appendages slightly lighter, tarsi of legs nearly white.

Female.–Total length of body, 1.9 mm; cephalothorax length, 1.1 mm; width of body at widest portion 2.1 mm. Similar in appearance to male but lacking the enlarged area of leg II.

Type data.–Male holotype and male and female paratypes from Las Cruces, near San Vito, Puntarenas, 1 August 1976.

Additional records.–Limon, Siquirres, 26 July 1976, one female.

Remarks.–This species has a very distinctive eye tubercle and general appearance, easily separating it from other members of this genus.

Costabrimma nicoyensis, new species
Figs. 8-15

Description of male holotype.–Total length of body, 1.7 mm; cephalothorax length, 0.6 mm; width of body at widest portion, 1.2 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.15-0.20-0.20-0.15; Femur 0.55-0.70-0.60-0.76; Patella 0.35-0.30-0.25-0.25; Tibia 0.50-0.50-0.50-0.60; Metatarsus 0.40-0.65-0.60-0.90; Tarsus 0.40-0.60-0.40-0.45; Total 2.35-2.95-2.55-3.11.

Surface of cephalothorax smooth, eye tubercle on anterior margin, large with forward pointing spine and large eyes at base. Anterior margin of cephalothorax with rounded tubercles at the lateral margins. Abdomen rounded, broader than cephalothorax, dorsal areas indicated by transverse rows of rounded tubercles. Each free tergite with a transverse row of blunt rounded tubercles. Ventral surface relatively smooth. Coxa I and II each with a median transverse row of low tubercles which are larger at the distal portion. Coxa III with low tubercles on the anterior and posterior margins. Coxa IV with scattered tubercles which are larger on the lateral border. Each free sternite with a median transverse row of low tubercles. Anal operculum with slightly enlarged scattered tubercles. Spiracles slightly concealed.

Penis as in figure.

Palpus: trochanter, 0.15 mm long; femur, 0.3; patella, 0.1; tibia, 0.2; and tarsus, 0.2. Total length, 0.95 mm. Palpus armed as in figure. Femur with two ventral spines near the base, a single smaller spine on the outer border; a single median-apical spine on the patella; tibia and tarsus each with two spines on either side. Tarsal claw slender; chelicerae not enlarged, claws slender.

All segments of the legs with numerous hairs; trochanters rounded, trochanter III with enlarged tubercles. Femur, tibiae, and patellae of legs III and IV somewhat curved with heavier tubercles. Tibia of leg II with a ventral enlargement as in figure. Tarsal segments: 3-5-5-5.

Dorsum uniform yellow brown, appendages concolorous with dorsum; tarsi somewhat lighter; metatarsus II darker.

Female.—Total length of body, 1.75 mm; cephalothorax, 0.55; width of body at widest portion, 1.3 mm. Similar in appearance to male, but lacking the enlargement of tibia II and the small spines of leg IV.

Type data.—Male holotype, two male paratypes, one female and four immatures from Jabilla, Nicoya Peninsula, Puntarenas, 12 July 1976.

Additional records.—Guanacaste, Santa Rosa National Park, three males, one female, three immatures, 7 July 1976; Puntarenas, Nicoya Peninsula, Reserve near Cabuya, one male, 11 July 1976; Puntarenas, Nicoya Peninsula, Tambor, three males, five females, three immatures, 8 July 1976; Puntarenas, Manuel Antonio National Park, one male, two females, 21 July 1976.

Remarks.—As with other species of this genus, this form has a distinctive eye tubercle and an unusual leg enlargement.

Costabrimma terrena, new species
Figs. 16-21

Description of male holotype.—Total length of body, 2 mm; cephalothorax length, 0.75 mm; width of body at widest portion, 1.5 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.2-0.2-0.2; Femur 0.6-0.7-0.7-0.9; Patella 0.2-0.2-0.3-0.4; Tibia 0.4-0.7-0.5-0.8; Metatarsus 0.6-0.7-0.7-0.9; Tarsus 0.5-0.8-0.6-0.7; Total 2.5-3.3-3.0-3.9.

Anterior margin of cephalothorax with two blunt spines on either side. Eye tubercle only slightly removed from the anterior margin of the cephalothorax, in the form of a blunt cone with several blunt spines on the dorsal surface. Each dorsal area with a median row of low hair-tipped blunt spines. Anal operculum with numerous similar spines. Coxae with low tuberculations. Coxa II with a larger blunt spine at the posterior-lateral border; coxa IV with three blunt tubercles at the anterior margin. Genital operculum somewhat triangular in shape, spiracles nearly concealed by posterior portions of coxae IV and a series of low projections on either side of the first free sternite. Sternites each with a transverse row of low tuberculations.

Penis a sclerotized shaft, enclosing softer structures, 0.75 mm long.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.3; tibia, 0.3; and tarsus 0.3. Total length, 1.5 mm. Palpus armed as in figure. Trochanter with a few low tuberculations on all surfaces. Femur and patella each with a median apical spine. Chelicerae normal both portions of claw without teeth.

All segments of legs but tarsi with spines and hairs. Femur I with several ventral spines at the proximal third; femur and patella of leg II each with a ventral enlargement as illustrated; all segments of leg III with heavier tuberculations and low spines; leg IV likewise armed, femur somewhat curved, tibia with numerous hairs. Tarsal segments 3-5-5-6.

Color uniform yellow brown, tarsi of legs somewhat lighter.

Female.—Total length of body, 2 mm; cephalothorax length, 0.75 mm; width of body at widest portion, 1.35 mm. Similar in appearance to male, but lacking the enlarged portions of leg II. Ovipositor encircled with setae.

Type data.–Male holotype and three females paratype from La Selva, Heredia, 4 July 1976.

Additional records.–Puntarenas, Osa Peninsula, Llorona Ridge Trail, five males, four females, two immatures, 24 August 1979; Puntarenas, Coto, one male, two females, 18 February 1957 (F. Dixon).

Remarks.–The unusual appearance of the eye tubercle and the enlargement of portions of leg II distinguish this species from others.

Key for the Identification of Males of the Genus *Dapessus*

1. Leg IV more than 14 mm long 2
   Leg IV less than 14 mm long 4

2. Dorsum extremely dark, palpi lighter, contrasting *D. llorensis*
   Body much lighter in color 3

3. Abdomen arched, body more than 3 mm long, dorsal areas with transverse rows of tubercles, light reddish-yellow in color . . . . . *D. parallelus*
   Abdomen not arched dorsally, body under 3 mm long, color pale yellow or reddish . . . . . *D. gracilipes*

4. Basal segments of tarsus III enlarged 5
   Basal segments of tarsus III not enlarged 6

5. Body more than 3 mm long, first two basal segments of tarsus II usually fused, thus tarsal segments appear to number 3-7-4-6 . . . . . *D. tarsalis*
   Body 2 mm long, with tubercles along lateral margin of abdomen and anal operculum tarsal segments 3-7-5-6 . . . . . .*D. foliatus*

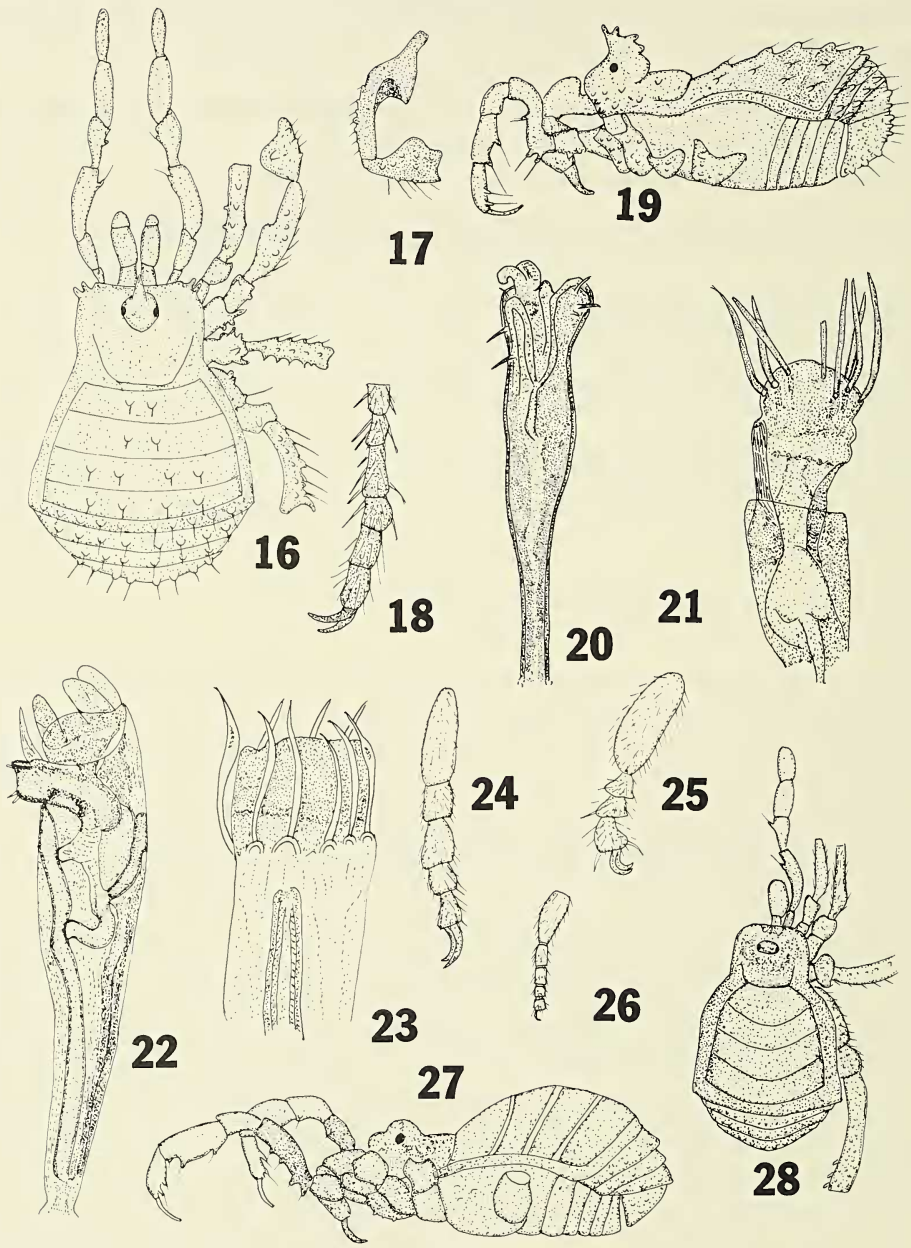
6. Body noticeably arched dorsally, cephalothorax narrower than abdomen 7
   Body not arched dorsally, cephalothorax of same width or only slightly narrower than the abdomen 8

7. Body over 4 mm long, dark reddish brown in color . . . . . *D. zalmoxiformis*
   Body less than 4 mm long, dorsal areas indicated by darker markings . . . . . *D.vitensis*

8. Color reddish-brown, trochanters of legs, patella, tibia, and tarsus of palpus light, contrasting with dorsal portion of abdomen . . . . . *D. albitrochanteris*
   Color light yellow brown, dorsal areas of abdomen outlined in a somewhat darker color . . . . . .*D. atroluteus*

Dapessus Roewer

Cynortina Banks 1909:228 (nec *Cynortina* Weise 1905:331); Roewer 1923:120, 1933:277; Soerensen 1932:263; Goodnight and Goodnight 1953:14.
Dapessus Roewer 1933:279.
Hewus Goodnight and Goodnight 1942a:2. **NEW SYNONYMY.**
Kalina Goodnight and Goodnight 1942a:2. **NEW SYNONYMY.**
Resinthicus Roewer 1949a:19. **NEW SYNONYMY.**
Parisminia Roewer 1949a:25. **NEW SYNONYMY.**
Sphingonus Roewer 1949a:26. **NEW SYNONYMY.**
Glizotus Roewer 1949a:28. **NEW SYNONYMY.**
Tetesia Roewer 1949a:25. **NEW SYNONYMY.**



Figs. 16-21.—*Costabrimma terrena*, new species: 16, dorsal view of male; 17, femur and patella of leg II of male; 18, tarsus IV of male; 19, lateral view of male; 20, lateral view of penis; 21, dorsal view of distal portion of ovipositor.

Figs. 22-28.—*Dapessus tarsalis* (Banks): 22, lateral view of penis; 23, dorsal view of tip of ovipositor; 24, tarsus of leg IV of male; 25, tarsus of leg III of male; 26, tarsus of leg III of female; 27, lateral view of male; 28, dorsal view of male.

Type species.–*Dapessus tarsalis* (Banks).

Diagnosis.–Small to medium sized animals, cephalothorax somewhat narrower than the abdomen. Eye tubercle without a dorsal spine, slightly removed from the anterior margin of the cephalothorax. Dorsal areas five in number, first area without a median line, dorsal borders of areas parallel. Free tergites smooth, spiracle usually concealed by a portion of coxa IV. Tarsal segments 3-6 or more than 6-5-6. Distitarsus of first tarsus with two segments, second with three. Metatarsi of legs without astraguli or calcanei. Tarsal claws of legs III and IV, double, smooth. Penis a chitinous shaft, usually somewhat inflated at the distal portion, enclosing softer structures. Secondary sexual characters variable, but usually consisting of enlarged basal segments of tarsus III and varying leg lengths.

Remarks.–Species of this genus are separated from one another on the basis of relative leg lengths, coloration, general body configuration, and presence or absence of various tubercles and spines.

Dapessus tarsalis (Banks), new combination
Figs. 22-28

Cynortina tarsalis Banks 1909:228.
Dapessus tarsalis Roewer 1933:279, fig. 3.

Description of male.–Total length of body, 3.3 mm; cephalothorax length 1.0 mm; width of body at widest portion, 2.4 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.5-0.5-1.2; Femur 0.9-1.6-1.3-1.2; Patella 0.5--0.8-0.5-0.9; Tibia 0.8-1.1-0.9-1.7; Metatarsus 1.2-1.4-1.2-2.0; Tarsus 0.9-1.5-1.2-1.2; Total 4.6-6.9-5.6-8.2.

Entire surface of body quite smooth; cephalothorax somewhat narrow with the eye tubercle slightly removed from the anterior margin. Two small spines present on the eye tubercle. Though the dorsal areas of most specimens were quite smooth, a few of those examined had some low tubercles at the anterior lateral border of the abdomen. Each free tergite with a transverse row of low tubercles which are slightly larger on the third free tergite. Venter relatively smooth. Coxa I with a few larger tubercles on the anterior surface, coxa IV slightly rough. Genital operculum smooth; spiracle openings partially concealed by a portion of coxa IV. Anal operculum with a few larger tubercles.

Penis a slender shaft, 1.35 mm long.

Palpus: trochanter, 0.2 mm long; femur. 0.9 patella, 0.5; tibia, 0.6; and tarsus, 0.5. Total length, 2.7 mm. Palpus armed as in figure; femur and patella each with an anterior-median spine. Chelicerae not enlarged, normal in size.

All segments of the legs but the metatarsi and tarsi with low tubercles which are somewhat larger on the femora, patellae, and tibiae of legs III and IV, largest ones on IV. Femur IV somewhat S-shaped.Tarsal segments: 3-7-4-6 Basal segment of tarsus III enlarged. Females found with the males had the tarsal number 3-7-5-6. Careful study of late instar males revealed that the enlarged single basal segment of the male's third tarsus actually was the result of the fusion of the proximal two segments. Thus the male and female appear to have differing numbers of tarsal segments.

The entire body of most specimens studied was a deep chocolate brown, nearly black; the boundaries of the dorsal areas were somewhat lighter. In some the darker color is present as irregular markings on the cephalothorax; trochanters of legs somewhat lighter in color than the dorsum, remaining segments of the legs also lighter; chelicerae much lighter than the dorsum. Patellae, tibiae, and tarsi of palpi light yellow, contrasting

strongly with the darker color of the body. While most specimens were typically dark, a few were much redder in appearance.

Female.—Total length of body, 3.0 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 2.3 mm. Female similar in appearance to male but with five segments in tarsus III. One female examined was nearly orange in color, the legs were much darker and the palpi were conspicuously lighter. Ovipositor as figured.

Type data.—Five males and one female from La Palma (J. F. Tristan), MCZ, examined. Banks did not specify a holotype, indicating only "type" on the vial; he did not specify the location of the locality La Palma, nor did he indicate the date of collection.

Additional records.—Rio Parismina, Caribbean coast (Roewer's record), NHMS, examined (= Roewer's holotype of *D. tarsalis*.) Guanacaste, Monteverde, cloud forest, one male, three females, 26 June 1978; three males, seven females, five immatures, 27 July 1978; two males, one female 1 July 1976.

Remarks.—During the study of this genus it was pointed out that the generic name *Cynortina*, as set up by Banks and for so long recognized as a valid name actually was preoccupied. Weise, 1905, used this name; thus *Cynortina* must be replaced by the name *Dapessus* as described by Roewer, 1933. This adds another complication inasmuch as Roewer called his species *Dapessus tarsalis*, and our studies showed that Roewer and Banks had, indeed described the same animal. Roewer's name thus constitutes a homonym. Fortunately we had a considerable series of animals for our studies and were able to verify these confusing details.

Dapessus albitrochanteris (Roewer), new combination
Figs. 29-34

Cynortina albitrochanteris Roewer 1933:277.

Description of male.—Total length of body, 3.1 mm; cephalothorax length, 0.9 mm; width of body at widest point, 2.2 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.4-0.5; Femur 0.8-1.6-1.2-1.8; Patella 0.4-0.7-0.5-0.8; Tibia 0.6-1.2-0.9-1.6; Metatarsus 1.1-1.7-1.6-2.5; Tarsus 0.6-1.3-0.8-1.0; Total 3.8-6.9-5.4-8.2.

Entire dorsum with low tuberculations, eye tubercle low, rounded slightly removed from the anterior margin of the cephalothorax. Low tubercles present alone the lateral border of the dorsum, terminating in slightly larger tubercles. Free tergites with only very low tuberculations; third free tergite with a pair of low spines on the posterior border. Ventral surface with scattered granulations. Coxa I with a median row of slightly larger tubercles: coxa III with a median row of teeth like tubercles at the distal portion, similar tubercles present on the posterior border, but extend over the entire length; coxa IV with slightly more conspicuous granulations. Genital operculum smooth. Free sternites and anal operculum with scattered granulations. Spiracles partially concealed.

Penis a slender shaft with a complex bifid spine at the tip, 0.9 mm long.

Palpus: trochanter, 0.3 mm long; femur, 0.5; patella, 0.3; tibia, 0.4; and tarsus, 0.4. Total length, 1.9 mm. Segments armed as in figure. Chelicera normal in size, claws smooth.

Femora, patellae, and tibiae of legs slightly enlarged; metatarsi and tarsi slender. Proximal segment of tarsus of leg III enlarged in most males examined. Tarsal segments: 3-7-5-6.

Entire dorsum and venter reddish-brown, netted with black on the cephalothorax; dorsal areas defined by darker coloration on the lateral and posterior borders. Free

tergites somewhat darker. Trochanters, particularly those of legs III and IV light, contrasting strongly with the dorsum in most specimens. Patellae, tibiae, and tarsi of palpi similarly light yellow. The proximal portion of femur IV, distal portion of tibia IV and proximal portion of metatarsus IV lighter; tarsi of legs only slightly lighter. There are slight color variations among individuals with some showing lighter colors which contrast very strongly with the dorsum.

Female.–Total length of body, 2.8 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.2 mm. Similar in appearance to male, but lacking the enlarged proximal segment of tarsus III. Ovipositor as illustrated.

Type data.–Four females, two immatures from Waldeck Farm, 45 km northwest of Limon, LImon, 15 May 1930 (Roewer's record) NHMS, examined.

Additional record.–Limon, Bomba, 21-22 July 1976, two males.

Remarks.–This animal is quite easily identified due to its distinctive coloration.

Dapessus atroluteus (Roewer), new combination
Figs. 35-38

Parisminia atroluteus Roewer 1949a;25, figs. 31a-d.

Description of male holotype.–Total length of body, 2.4 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.7 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.4-0.3-0.4; Femur 0.9-1.8-1.5-3.1; Patella 0.4-0.4-0.4-0.7; Tibia 0.7-1.6-0.9-2.8; Metatarsus 1.2-1.8-1.7-3.1; Tarsus 0.8-1.6-1.0-1.2; Total 4.2-7.6-5.8-11.3.

Entire surface of body smooth, eye tubercle low, slightly removed from anterior margin of cephalothorax, with a low raised area extending from the eye tubercle to the anterior margin. Dorsal areas clearly indicated by darker coloration, only slightly granulate. Free tergites with a few low tuberculations, otherwise smooth. Ventral surface smooth, a few fine hairs visible on coxa IV; coxa III with very low tooth-shaped tubercles on anterior and ventral surfaces. Spiracles partially concealed by coxae IV. Free sternites smooth, only a few low tubercles on the anal operculum.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.3; tibia, 0.4; tarsus 0.4. Total length, 1.7 mm. Segments armed as in figure. Femur and patella each with a median apical spine. Ventrally the femur with two proximal spines, tibia with three spines on inner surface, two on outer. Chelicera not enlarged.

All segments of legs smooth, with only an occasional low tubercle. Femur, tibia, and metatarsus of leg IV elongate. Tarsal segments: 3-7-5-6.

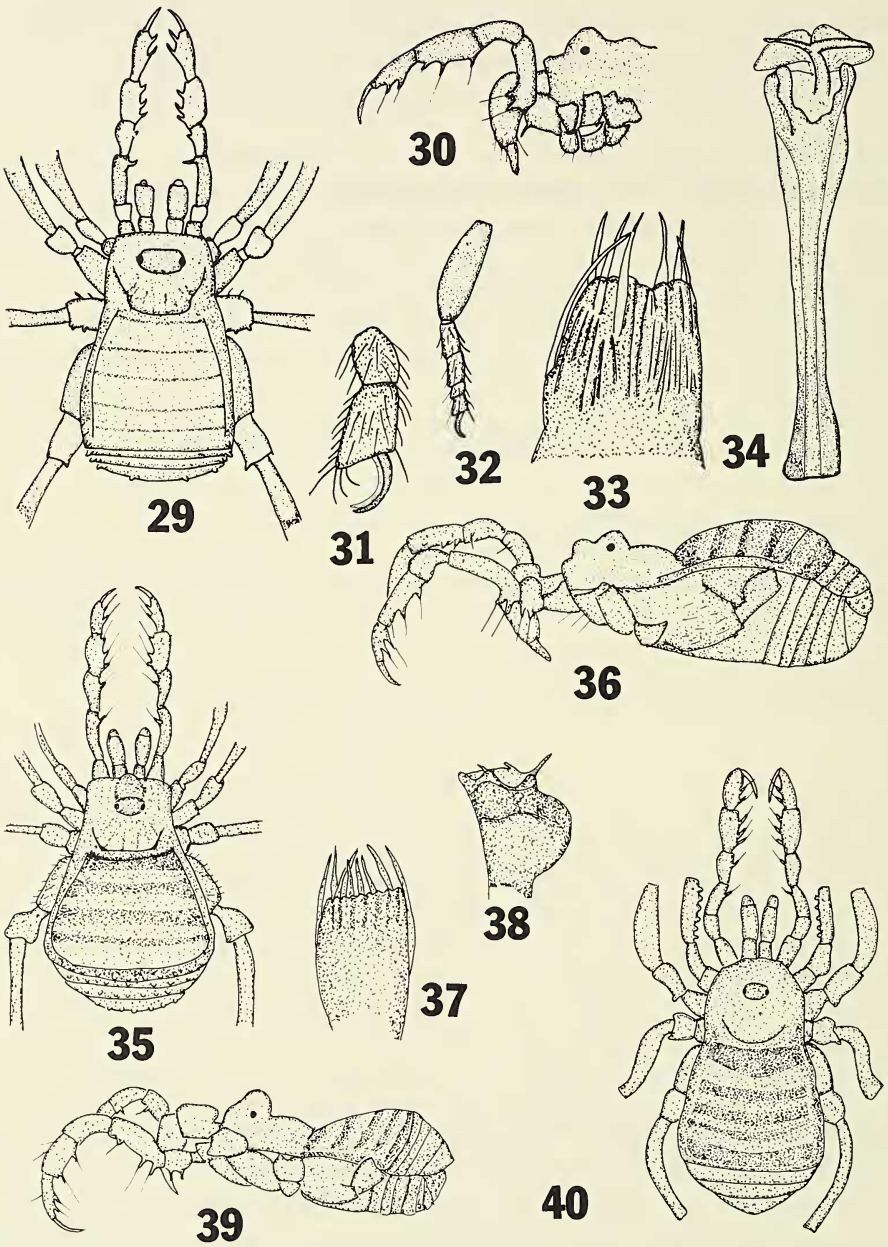
Entire dorsum light yellow brown, dorsal areas outlined in a somewhat darker color.

Female.–Total length of body, 2.4 mm; cephalothorax length, 0.7 mm; width of body at widest portion, 1.6 mm. Similar in appearance to male, but with femur IV somewhat shorter, S-shaped. Femora with following lengths: 0.6 mm-0.8 mm-0.7 mm-1.1 mm.

Type data.–Male holotype and female paratype from St. Clara on the Parismina River. Atlantic coast (Roewer's record) NHMS. examined.

Dapessus brevis (Roewer), new combination
Figs. 39-40

Resinthicus brevis Roewer 1949a;19, figs. 18a-d.



Figs. 29-34.–*Dapessus albitrochanteris* (Roewer): 29, dorsal view of male; 30, lateral view of cephalothorax, palpus, and chelicera of male; 31, tarsus IV of male; 32, tarsus III of male; 33, dorsal view of distal portion of ovipositor; 34, dorsal view of penis.

Figs. 35-38.–*Dapessus atroluteus* (Roewer): 35, dorsal view of male; 36, lateral view of male; 37, distal portion of ovipositor; 38, distal portion of penis.

Figs. 39-40.–*Dapessus brevis* (Roewer): 39, lateral view of female; 40, dorsal view of female.

Description of female holotype.–Total length of body, 1.75 mm; cephalothorax length, 0.6 mm; width of body at widest portion, 1.25 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.1-0.2-0.2-0.3; Femur 0.4-0.7-0.5-0.8; Patella 0.3-0.4-0.3-0.4; Tibia 0.4-0.6-0.5-0.7; Metatarsus 0.6-0.7-0.5-0.7; Tarsus 0.5-0.9-0.5-0.7; Total 2.3-3.5-2.6-3.8.

A small animal without any distinctive features; cephalothorax smooth, eye tubercle low, rounded, slightly removed from the anterior margin of the cephalothorax. Free tergites smooth. Ventral surface similarly smooth, with some hairs and low granulations on the anal operculum. Coxa IV with a short spine at the distal portion; coxa III with a few teeth on the anterior and posterior borders. Spiracle partially concealed by a portion of coxa IV.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.2; tibia, 0.3; tarsus, 0.3. Total length, 1.4 mm. Palpus armed as in figures. Femur and patella each with an apical median spine. Tibia with three spines on inner border. Chelicera small, first segment with a small dorsal enlargement.

All segments of legs with low granulations and hairs. These granulations are somewhat larger on the trochanters. Femur I with a series of low tubercles: femora III and IV slightly S-shaped. Tarsal segments: 3-6-5-6.

Entire body light reddish-brown, appendages similar in color; tarsi somewhat light.

Type data.–One female, Panzos (Roewer's record) NHMS, examined.

Remarks.–An examination of the holotype revealed that it was a female. Due to the small size and poor condition, the genitalia were not removed for detailed study.

Dapessus foliatus, new species

Figs. 41-45

Description of male holotype.–Total length of body, 2 mm; cephalothorax length, 0.6 mm; width of body at widest portion, 1.3 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.3-0.3-0.4; Femur 0.5-0.7-0.5-1.2; Patella 0.3-0.4-0.3-0.6; Tibia 0.4-0.7-0.5-1.1; Metatarsus 0.6-0.8-0.8-1.1; Tarsus 2.5-3.8-3.1-5.2. Total 2.5-3.8-3.1-5.2.

Small animal; abdomen arched, slightly wider than the cephalothorax. All dorsal surfaces smooth. Eye tubercle low, rounded, slightly removed from the anterior margin of the cephalothorax. Dorsal areas clearly defined. Lateral borders of dorsum with low spines, a similar spine present on either side of each free tergite. Dorsal portion of anal operculum with spine visible from dorsal view. Ventrally, coxal surfaces with fine granulations. Free sternites and genital operculum likewise smooth; each free sternite with a small spine on the lateral portion. Ventral portion of anal operculum with three spines. Spiracles partially concealed by low spines from the first abdominal sternite.

Penis a chitinized shaft, slightly enlarged at the distal end, 0.63 mm long.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.2; tibia, 0.3; and tarsus, 0.2. Total length, 1.3 mm. Palpus armed as in figure. Femur and patella each with a median apical spine. Chelicera normal in size, smooth.

All surfaces of legs but tarsi granulate in appearance. Femur IV curved, with spines as illustrated; tibia IV with a few low spines distally. Basal tarsal segment of leg III elongate and heavier. Tarsal segments: 3-7-5-6.

Entire animal light brownish-yellow. Dorsal areas somewhat lighter. Palpi lighter, legs nearly concolorous with the dorsum. Distal portions of tibia, metatarsus, and tarsus of leg IV lighter.

Female.—Total length of body, 2.1 mm; cephalothorax length, 1.1 mm; width of body at widest portion, 1.3 mm. Similar in appearance to male, but lacking the large spines of femur IV and the enlarged basal segments of tarsus III. Ovipositor 1.26 mm long.

Type data.—Male holotype and female paratype from Coto, Puntarenas, 17 September 1956 (E. Dixon).

Additional records.—Puntarenas, Coto, 17 September 1957 (E. Dixon), one male, two females; one male, 12 September 1957 (E. Dixon).

Remarks.—This species is quite distinctive due to the presence of spinose tubercles on the dorsum and legs.

Dapessus gracilipes (Roewer), new combination
Figs. 46-48

Tetesia gracilipes Roewer 1949a:26, figs. 35a-d.

Description of male holotype.—Total length of body, 2.5 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.65 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.4-0.4; Femur 1.6-4.1-2.5-6.3; Patella 0.4-0.7-0.5-0.6; Tibia 1.2-3.7-1.7-6.1; Metatarsus 2.4-6.0-3.3-7.6; Tarsus 1.0-2.0-1.3-1.3; Total 6.9-16.9-9.7-22.3.

A slender animal with elongated legs. Entire body, including appendages nearly smooth, with only an occasional hair, and a row of low blunt tubercles present along the lateral borders of the dorsal scute, terminating in a blunt spine at the posterior lateral border. Eye tubercle low, slightly removed from the anterior margin of the cephalothorax, a slight elevation anterior to it. Dorsal areas not clearly defined. A few very low tubercles present on the posterior border of the third free tergite; a few scattered over the anal operculum. Venter, like dorsum, smooth. Coxa I with a few low tubercles present on the median area; coxa III with low tubercles on both anterior and posterior margins. Free sternites with only a few roughened areas, spiracle concealed.

Penis a slender chitinized shaft, expanded at the distal end, 0.99 mm long.

Palpus: trochanter, 0.3 mm long; femur, 0.5; patella, 0.3; tibia, 0.4; and tarsus, 0.4. Total length, 1.9 mm. Palpus slender, armed as in figure; femur and patella each with an anterior median spine. Chelicera normal in size.

Legs extremely long and slender, all segments but trochanters and patellae much elongated. Tarsal segments: 3-7-5-6.

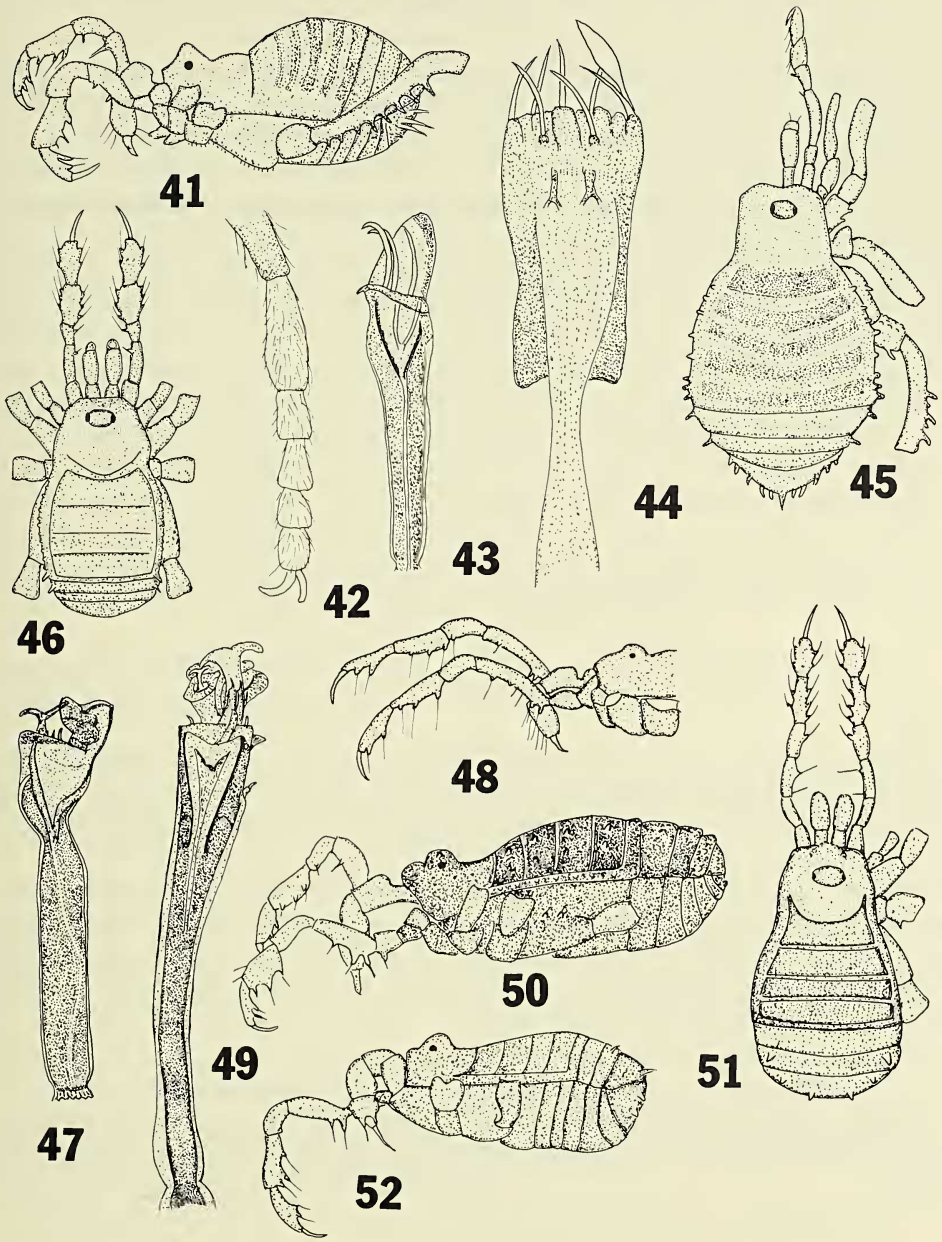
Entire body and appendages pale yellow brown.

Female.—Total length of body 2.4 mm; cephalothorax length, 0.75 mm; width of body at widest portion, 1.6 mm. Similar in appearance to male, but with shorter legs. Femora of legs with the following lengths: 1 mm-1.9 mm-1.4 mm-2.2 mm.

Type data.—Male holotype and female paratype from Tetes (Roewer's record) NHMS, examined.

Additional record.—Heredia, La Selva, one male, 6 January 1978 (O. F. Francke).

Remarks.—The specimen from La Selva differed slightly from the holotype in its coloration: it was reddish-brown with lighter palpi. Trochanter IV was also lighter, though other segments of the legs were concolorous with the dorsum. In size, this individual was slightly larger: total length, 2.8 mm; cephalothorax length, 0.8 mm; width of body at widest point, 1.7 mm. The leg lengths were as follows: 8.1 mm-21.6 mm-12.9 mm-30.8 mm.



Figs. 41-45.–*Dapessus foliatus*, new species: 41, lateral view of male; 42, tarsus III of male; 43, lateral view of penis; 44, dorsal view of ovipositor; 45, dorsal view of male.

Figs. 46-48.–*Dapessus gracilipes* (Roewer); 45, dorsal view of male; 47, lateral view of penis; 48, lateral view of cephalothorax, palpus, and chelicera of male.

Figs. 49-50.–*Dapessus llorensis*, new species: 49, lateral view of penis; 50, lateral view of male.

Figs. 51-52.–*Dapessus tenuis* (Roewer): 51, dorsal view of female; 52, lateral view of female.

Dapessus llorensis, new species
Figs. 49-50

Description of male holotype.—Total length of body, 2.7 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 1.7 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.5-0.5-0.6; Femur 2.1-5.4-3.1-5.7; Patella 0.5-0.8-0.5-1.1; Tibia 1.5-5.4-2.1-6.8; Metatarsus 2.8-9.3-3.5-8.7; Tarsus 1.0-2.1-1.4-1.7; Total 8.2-23.5-11.1-24.6.

Dorsal body surface roughened in appearance. Eye tubercle low, slightly removed from the anterior margin of the cephalothorax, with two very low tubercles above. Abdominal areas not well defined. Each area with a transverse row of slightly enlarged tubercles, a row of low tubercles on each lateral margin. Each free tergite with a transverse row of slightly enlarged tubercles, larger ones on the outer border. Anal operculum with a few enlarged tubercles. Third free tergite with two much larger spines. Free sternites smooth; coxae with very fine granulations. Coxa III with a few tooth-like tubercles on the posterior surface; coxa IV with a few larger granulations visible from dorsal view, with a ventro-posterior blunt spine which partially conceals the spiracle, genital operculum smooth.

Penis a slender sclerotized shaft, 0.96 mm long.

Palpus:trochanter, 0.3 mm long; femur, 0.8; patella, 0.4; tibia, 0.4; and tarsus, 0.4. Total length, 2.3 mm. Palpus armed as in figure. Femur and patella each with an anterior-median spine. Tibia with three spines on either side; tarsus with two. Chelicera normal in size.

All segments of legs smooth; trochanter III with a low spine at the posterior-proximal position; femur I with a few spinose tubercles on the ventral surface. Tarsal segments: 3-8-5-6.

Entire animal very dark brown, nearly black, giving it a very distinctive appearance. Palpi much lighter, contrasting strongly with the dorsum. Chelicerae also light in color, but somewhat darker than the palpi. All leg segments dark brown, slightly lighter than the dorsum.

Female.—Total length of body, 3.5 mm; cephalothorax length, 1.2 mm; width of body at widest point, 2.2 mm. Similar in appearance to male, but with slightly shorter legs. The legs measure: 5.3 mm-11.7 mm-8.9 mm-12.3 mm. Ovipositor with numerous setae.

Type data.—Male holotype, one male paratype, and two female paratypes from Sirena, Osa Peninsula, Puntarenas, 24 August, 1979.

Additional records.—Puntarenas, Osa Peninsula, Llorona, 9 August 1978, four males, four females; Llorona Swamp Trail, 23 August 1979, one male, one female.

Remarks.—In color, this form resembles *D. tarsalis*, but is has tubercles on the dorsum and the dorsal areas are not slightly bowed as in *D. tarsalis*. The penes are quite different distally.

Dapessus parallelus (Goodnight and Goodnight), new combination
Figs. 53-56

Kalina parallelus Goodnight and Goodnight 1942a:3, figs. 14-15.

Description of male.—Total length of body, 3.2 mm; cephalothorax, 1 mm; width of body at widest portion, 2.5 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.4-0.5; Femur 1.1-2.1-2.0-5.3; Patella 0.5-1.0-0.7-1.4; Tibia 1.9-1.6-1.5-4.5; Metatarsus 1.6-2.3-2.6-6.1; Tarsus 0.7-1.5-0.9-1.3; Total 6.1-8.9-8.1-19.1.

Entire body smooth. Eye tubercle removed from the anterior margin of the cephalothorax, two very small spines at the anterior-lateral margin of the cephalothorax. Each dorsal area with a transverse row of very low tubercles. Free tergites smooth, third with a very low tubercle at the posterior lateral margin. Venter likewise smooth. Coxa III with a few low teeth on the anterior and posterior borders. Other coxal surfaces smooth. Free sternites smooth with only a few very low tubercles at the lateral margins. Anal operculum smooth, spiracle concealed slightly by coxa IV.

Penis as illustrated.

Palpus: trochanter, 0.3 mm long; femur, 0.6; patella, 0.3; tibia, 0.5; and tarsus, 0.5. Total length, 2.2 mm. Palpal surface with fine hairs, spines as in figure. Femur and patella each with a median-apical spine; tibia and tarsus each with two large and one small spine on either side.

Legs with all segments very smooth; trochanters with a few low tubercles, remaining segments clothed only with scattered fine hairs. Tarsal segments: 3-7-5-6.

Color of entire body light reddish-yellow, trochanters of legs slightly lighter, remainder of appendages concolorous with the dorsum.

Type data.–Male holotype and male paratype from Port Limon, Limon, 25 March, 1905 (F. C. Paulmeier) AMNH, examined.

Dapessus tenuis (Roewer), new combination
Figs. 51, 52

Glizotus tenuis Roewer 1949a:28, figs.38a-e.

Description of female holotype.–Total length of body, 2.7 mm; cephalothorax length, 0.8 mm; width of body at widest point, 1.7 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.3-0.3-0.3; Femur 0.9-2.1-1.3-2.5; Patella 0.6-0.4-0.6-0.7; Tibia 0.8-1.6-1.0-1.8; Metatarsus 1.3-2.1-1.6-1.3; Tarsus 0.7-1.0-1.0-2.1; Total 4.6-7.5-5.8-8.7.

Dorsum smooth. Eye tubercle slightly removed from the anterior margin of the cephalothorax, low, rounded above. Dorsal areas smooth, free tergites likewise smooth, third with four spines, central ones slightly larger than lateral ones. Ventral surfaces smooth, with some scattered hairs. Coxa III with a few low teeth on the anterior and posterior surfaces; free sternites smooth; anal operculum with paired tubercles. Spiracle concealed.

Ovipositor with numerous setae.

Palpus: trochanter, 0.3 mm long; femur, 0.6; patella, 0.3; tibia, 0.4; and tarsus, 0.4. Total length, 2 mm. Palpus armed as illustrated. Femur and patella each with an apical median spine. Chelicera normal in size, smooth.

Legs having the femora, patella, and tibiae, slightly roughened. Tarsal segments 3-8-5-6.

Color of animal a uniform yellow brown; chelicerae and palpi somewhat lighter; trochanters of legs slightly lighter than dorsum, remainder of legs concolorous with the dorsum.

Type data.–Female holotype from Waldeck Farm, 45 km NW of Limon, Limon (Roewer's data), NHMS, examined.

Remarks.–Unfortunately there was but a single female available for study; thus the description is not entirely adequate for accurate identification of this form.

Dapessus trochantericus (Roewer), new combination
Figs. 57, 58

Parisminia trochantericus Roewer 1949a:25, figs. 33a-f.

Description of female holotype.—Total length of body, 1.8 mm; cephalothorax length, 0.6 mm; width of body at widest portion, 1.3 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.2-0.2-0.2; Femur 0.5-1.3-0.6-0.9; Patella 0.3-0.4-0.3-0.4; Tibia 0.4-0.7-0.5-0.7; Metatarsus 0.6-0.8-0.7-0.9; Tarsus 0.4-0.9-0.5-0.6; Total 2.4-4.3-2.8-3.7.

Entire dorsum and free tergites smooth. Eye tubercle low, rounded dorsally, removed from the anterior margin. Dorsal areas indicated clearly by darker markings. Venter smooth, with some very low granulations. Coxa III with anterior and posterior rows of blunt teeth. Free sternites smooth, a few low tubercles on the anal operculum. Spiracles partially concealed by portions of coxae IV.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.3; tibia, 0.3; and tarsus, 0.2. Total length, 1.4 mm. Palpus armed as in figure, chelicera not enlarged.

All segments of the legs with scattered hairs; tarsi with granulations. Tarsal segments: 3-7-5-6.

Entire animal light yellow brown; dorsal areas slightly darker; appendages lighter.

Type data.—Female holotype from Rio Parismina on the Atlantic Coast (Roewer's data), NHMS, examined.

Remarks.—In the original description Roewer indicated that the holotype was a male; unfortunately, it is a female. Inasmuch as there was but a single specimen in relatively poor condition it was impossible to study the genitalia without totally destroying the animal. Because of the sexual dimorphism so often present among the species of this genus, it is extremely difficult to be certain of the characters of the species from the examination of a single female. Possibly this species is a synonym of *D. atroluteus* (Roewer).

Dapessus vitensis, new species
Figs. 59-62

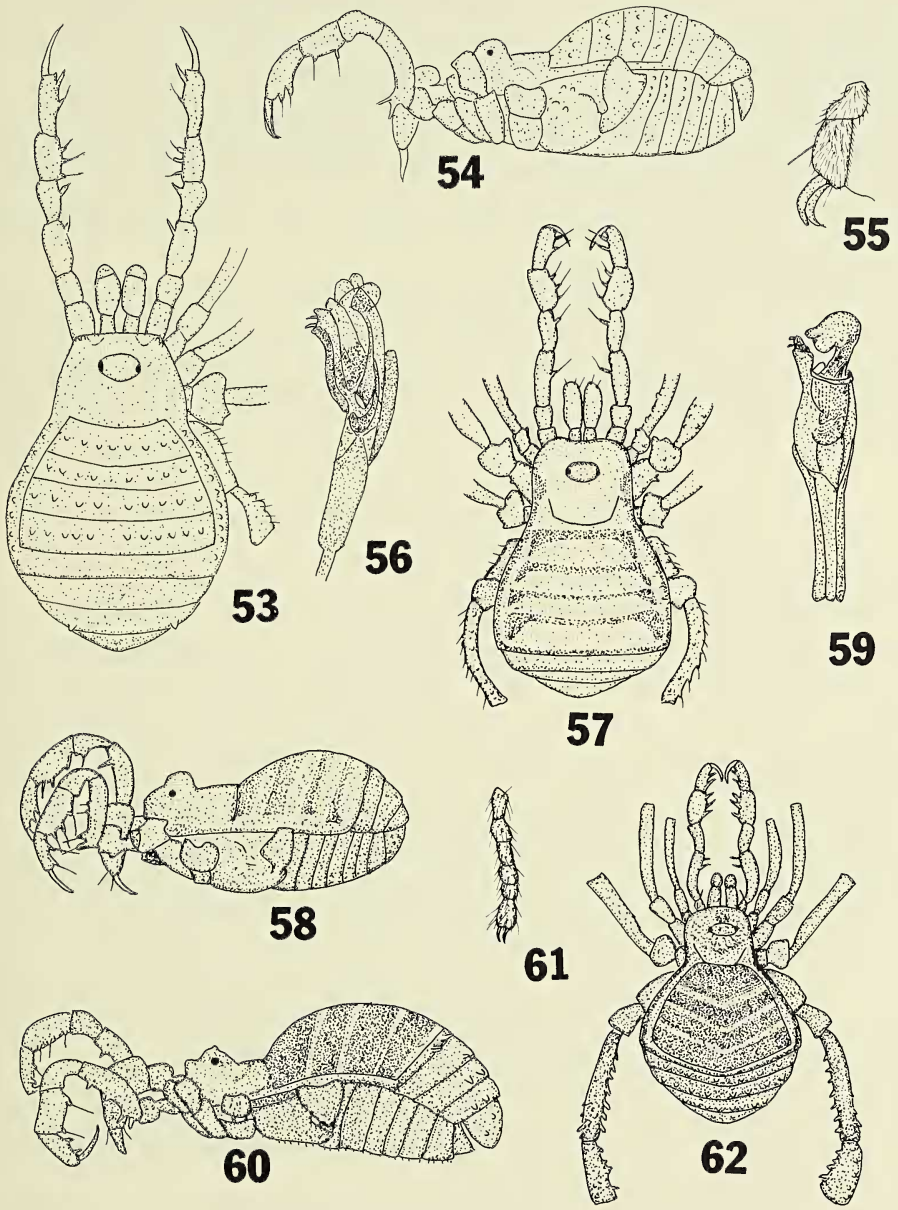
Description of male holotype.—Total length of body, 3.5 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 2.5 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.4-0.4-0.6; Femur 0.9-2.2-1.1-1.9; Patella 0.4-0.7-0.4-0.8; Tibia 0.7-1.1-1.6-1.1; Metatarsus 0.9-1.6-1.3-2.1; Tarsus 0.6-1.1-1.9-1.1; Total 3.7-7.1-5.8-7.6.

Cephalothorax much narrower (1.1 mm) than the abdomen. Abdomen arched; surface of both cephalothorax and abdomen smooth, with some small low tuberculations. Eye tubercle low, smooth, slightly removed from the anterior margin of the cephalothorax. Dorsal areas clearly indicated. Fifth area and each free tergite each with a transverse row of low spinose tubercles. Venter smooth, covered with fine hairs. Coxa of palpus with a few low tubercles; coxa III with a few tubercles on both anterior and posterior borders. Coxa IV smooth, slightly concealing the spiracle. Free sternites slightly roughened; dorsal portion of anal operculum with some low tubercles.

Penis a sclerotized shaft, dilated at apical portion, 1.29 mm long.

Palpus: trochanter, 0.2 mm long; femur, 0.5; patella, 0.4; tibia, 0.4; tarsus, 0.5. Total length 2 mm. Palpus armed as in figures. Femur and patella of palpus each with a median apical spine. Chelicera normal in size.

All segments of legs but tarsi with very low tubercles and numerous hairs. Femora, tibiae, and patellae rounded; metatarsi slender. Tarsal segments: 3-7-5-6.



Figs. 53-56.–*Dapessus parallelus* (Goodnight and Goodnight): 53, dorsal view of male; 54, lateral view of male; 55, distal segments of tarsus of leg IV of male; 56, distal portion of penis.

Figs. 57-58.–*Dapessus trochantericus* (Roewer): 57, dorsal view of female; 58, lateral view of female.

Figs. 59-62.–*Dapessus vitensis*, new species: 59, distal portion of penis; 60, lateral view of male; 61, tarsus of leg IV of male; 62, dorsal view of male.

Color of dorsum, venter, and femora, patellae, tibiae, and metatarsi of legs uniform dark reddish-brown. Tarsi of legs and tibiae and tarsi of palpi lighter. Dorsal areas black, some darker pencillings present on the cephalothorax, chelicerae, and femora of palpi.

Female.—Total length of body, 3.2 mm; cephalothorax length, 0.7 mm; width of body at widest portion, 1.7 mm. Similar to male in appearance.

Type data.—Male holotype, 3 male, 2 female paratypes, and several immature specimens from Las Cruces, near San Vito, Puntarenas, 1 August 1976.

Additional record.—Cartago, San Cristobal, 5300 feet altitude on Pan American Highway, 24 July 1976, two females.

Remarks.—In general appearance, this species is close to *Dapessus zalmoxiformis* (Roewer), but differs in color and size.

Considerable variation existed among some males, for some had more numerous spinous tubercles on the third free tergite and anal operculum than did the holotype. There was also some slight variation in the number of tarsal segments. A few females numbered 3-8-5-6. Immature forms typically had an arolium on the tarsi of legs III and IV.

Dapessus zalmoxiformis (Roewer), new combination
Figs. 63-65

Sphingonus zalmoxiformis Roewer 1949a:26, figs. 37a-d.

Description of male holotype.—Total length of body, 4.5 mm; cephalothorax length, 1 mm; width of body at widest portion, 3.2 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.6-0.6-0.8; Femur 1.2-1.9-1.5-2.6; Patella 0.6-0.8-0.7-1.2; Tibia 0.9-1.5-1.2-2.6; Metatarsus 1.3-2.0-1.7-3.1; Metatarsus 1.3-2.0-1.7-3.1; Tarsus 0.9-1.3-1.3-1.3; Total 5.2-8.1-7.0-11.6.

Body arched, surfaces smooth, cephalothorax somewhat narrower than abdomen. Eye tubercle low, rounded above. Anterior margin with a few low tubercles at the anterior lateral border. Dorsal areas clearly defined, areas with a few low scattered tubercles which are more evident on the fifth area. Each free tergite with a transverse row of very low tubercles. Numerous fine hairs present on the ventral surface, most evident on coxa IV. Coxa I with a few low tubercles; coxa II with both an anterior and posterior row of low teeth; coxa IV smooth. Spiracle partially concealed. Each free sternite with a transverse row of low tubercles. Anal operculum with a few enlarged tubercles.

Penis a chitinized shaft, enlarged at distal tip, 1.5 mm long.

Palpus: trochanter, 0.3 mm long; femur, 0.9; patella, 0.4; metatarsus, 0.7; and tarsus, 0.5. Total length, 2.8 mm. Palpus armed as in figure; femur and patella each with an anterior median spine. Chelicera normal in size.

All segments of legs except leg IV only slightly roughened. Trochanter III with a few tubercles on the posterior surface. Femur IV somewhat S-shaped, with numerous low tubercles which are somewhat enlarged toward the distal portion. Patella IV with numerous slightly enlarged tubercles; similar tubercles present on the tibia and metatarsus. Tarsal segments: 3-7-5-6.

Color dark reddish-brown, palpi and chelicerae much lighter; leg IV much darker.

Type data.—Male holotype from San Jose, San Jose (Roewer's data), NHMS, examined.

Neocynortina, new genus

Type species.–*Neocynortina dixoni*, new species.

Diagnosis.–A very small animal, body somewhat ovoid, with five dorsal areas, first without median line, borders parallel. Eye tubercle in the form of a cone, slightly removed from the anterior margin of the cephalothorax; spiracle visible, but not widely expanded. Tarsal segments: 3-6-5-6. Distitarsus of first tarsus with two segments, second with three. Double claws of legs III and IV arising independently, smooth. Metatarsi without astraguli or calcanei. Penis of male rounded, chitinized.

Neocynortina dixoni, new species
Figs. 66-69

Description of male holotype.–Total length of body, 1.6 mm; cephalothorax length, 0.5 mm; width of body at widest portion, 1.1 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.1-0.2-0.2-0.2; Femur 0.4-0.6-0.5-0.6; Patella 0.2-0.3-0.2-0.3; Tibia 0.3-0.4-0.4-0.5; Metatarsus 0.3-0.4-0.4-0.5; Tarsus 0.4-0.7-0.4-0.6; Total 1.7-2.6-2.1-2.7.

A small form, body somewhat ovoid in shape, eye tubercle only slightly removed from the anterior margin of the cephalothorax, somewhat cone-shaped with eyes at base. Surface of dorsum, free tergites, and venter with low tuberculations. Dorsal areas poorly defined. Surfaces of coxae and genital operculum with low granulations. Coxa II with a few posterior tubercles; coxa III with some low teeth on both anterior and posterior margins. Posterior margin of coxa IV with a few heavier granulations on the anterior surface. Spiracles visible, but not widely expanded.

Penis as illustrated, 0.4 mm long.

Palpus: trochanter, 0.15 mm long; femur, 0.45; trochanter, 0.25; tibia, 0.35; and tarsus, 0.3. Total length, 1.5 mm. Palpus armed as in figure; inner surface of femur with a single median and a single apical spine; patella with a single apical spine. Tibia with one median and one apical spine; tarsus with two spines on either side. Chelicera normal in size, first segment smooth above, second with numerous hairs.

All segments of legs but tarsi with low granulations, some hairs present. Femur IV slightly curved. Tarsal segments 3-6--5-6.

Body and appendages light brown-yellow, tarsi slightly lighter.

Female.–Total length of body, 1.6 mm; cephalothorax length, 0.5 mm; width of body at widest portion, 1.1 mm. Female similar to male in appearance, with little or no sexual dimorphism. Ovipositor bilobed, with several setae.

Type data.–Male holotype and female paratype from Coto, Puntarenas, 19 July 1957 (F. Dixon).

Additional record.–Puntarenas, Golfito, 27 August 1957 (F. Dixon), one female.

Key to the Identification of males of the genus *Pachylicus*

1. Leg IV more than 15 mm long . . . . . *P. rugosus*
   Leg IV less than 15 mm long 2
2. Surface of body with numerous spine-like hairs, covering all surfaces, including legs . . . . . *P. hispidus*
   Surfaces of body without such spine-like hairs 3

3. Spines present on the femora of legs I, II, and IV, dorsal areas of abdomen with transverse rows of hair-tipped spines . . . . . *P. spinatus*
   Only low tubercles present on femora, dorsum without conspicuous rows of hair-tipped spines 4

4. Dorsum with transverse rows of tubercles, median ones larger; tarsus of palpus with conspicuous fleshy protuberance . . . . . .*P. cotoensis*
   Dorsum with less conspicuous tubercles, no protuberance on tarsus of palpus 5

5. Metatarsus of leg IV curved, with small spine at distal end. . . . . .*P. hirsutus*
   Metatarsus of leg IV not curved, but enlarged distally. . . . . .*P. foveolatus*

Pachylicus Roewer

Metapachylus: Banks 1909:230 (nec *Metapachylus* Bates, 1889).
Parmitraceras Roewer 1912:155 (in part).
Pachylicus Roewer 1923:118.
Mexscotolemon Goodnight and Goodnight 1942c:3; 1942d:1.
Brimma Roewer 1949a:19.
Cerroa Roewer 1949a:25.

Type species.—*Metapachylus rugosus* Banks.

Diagnosis.—Small to medium sized opilionids with somewhat rounded bodies. Cephalothorax only slightly narrower than the abdomen. Eye tubercle slightly removed from the anterior margin of the cephalothorax, with a median spine. In most species, this spine is strongly curved forward. The five dorsal areas are clearly defined, first without a median line, dorsal borders parallel, often with spines or tubercles. Free tergites often with spines; free sternites usually smooth. Spiracles usually concealed by some portion of coxa IV.

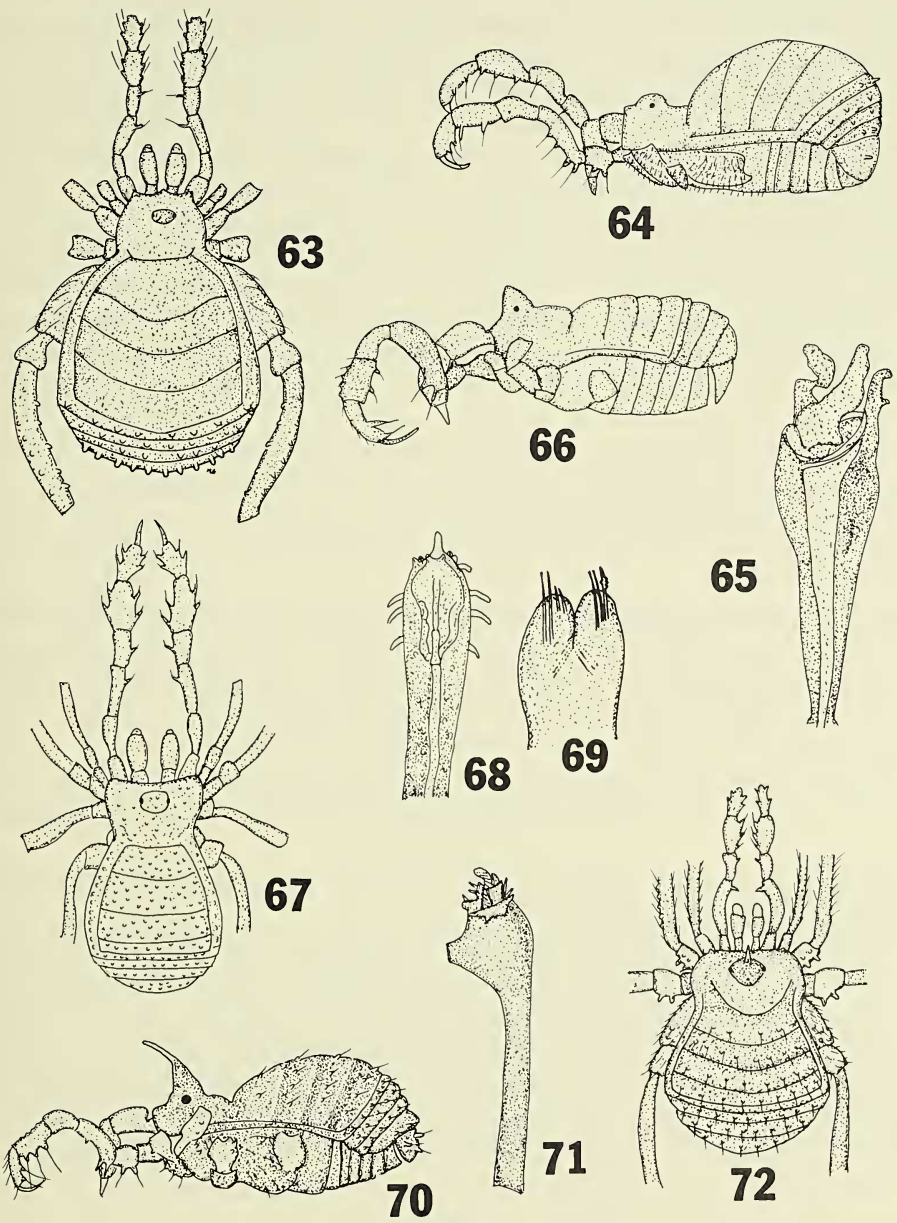
Tarsal segments: 3-6 or more than 6-5-5- or 6. Distitarsus of first tarsus with two segments, second with three. Metatarsi not divided into astraguli or calcanei. Tarsal claws of legs III and IV double, smooth, arising independently. Penis a chitinous shaft, usually somewhat inflated at the tip, softer portions varying in appearance. Secondary sexual characters variable, usually involving longer legs in the male or varying degrees of spination on the third and fourth legs.

Remarks.—Species are separated from one another on the basis of the form of the eye tubercle, the spination of the dorsum, coloration of the body, and secondary sexual characters.

Pachylicus rugosus (Banks)
Figs. 70-72

Metapachylus rugosus Banks 1909:230.
Parmitraceras rugosus: Roewer 1912:155.
Pachylicus rugosus: Roewer 1923:118, fig. 121.
Mexscotolemon insularus Goodnight and Goodnight 1942c:3, figs. 1-4. **NEW SYNONYMY.**
Cerroa hirsuta Roewer 1949a:25, figs. 34a-f. **NEW SYNONYMY.**

Description of male.—Total length of body, 4.3 mm; cephalothorax length, 1.3 mm; width of body at widest portion, 3.3 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.6-0.6-0.6-0.8; Femur 3.0-2.9-2.4-6.4; Patella 0.8-1.1-0.8-1.9; Tibia 1.3-2.4-1.9-6.2; Metatarsus 2.1-3.2-3.0-6.9; Tarsus 1.1-2.1-1.6-1.3; Total 8.9-12.3-10.3-23.5.



Figs. 63-65.–*Dapessus zalmoxiformis* (Roewer): 63, dorsal view of male; 64, lateral view of male; 65, distal portion of penis.

Figs. 66-69.–*Neocynortina dixoni*, new species: 66, lateral view of male; 67, dorsal view of male; 68, distal portion of penis; 69, distal portion of ovipositor.

Figs. 70-72.–*Pachylicus rugosus* (Banks): 70, lateral view of male; 71, lateral view of distal portion of penis; 72, dorsal view of male.

Cephalothorax smooth, eye tubercle slightly removed from the anterior margin, with a sharp forward pointing median spine. Dorsal areas clearly delineated; each area with a median row of light hair-tipped tubercles. Anal operculum with several large tubercles. Ventrally the coxae have some hair-tipped tubercles. Coxa I with a larger one near the basal area; coxa II with two larger hair-tipped tubercles at the posterior lateral border; coxa III with both anterior and posterior rows of blunt tubercles; coxa IV with numerous low hair-tipped tubercles on the anterior surface. Each free sternite with a transverse row of low hair-tipped tubercles. Spiracle slightly concealed by coxa IV.

Male penis somewhat club-shaped, distal end complex, 2 mm long.

Palpus: trochanter, 0.5 mm long; femur, 0.9; patella, 0.6; tibia, 0.8; tarsus, 0.6. Total length, 3.4 mm. Palpus armed as in figure; femur with two basal and one apical-median spine-tipped tubercles, patella with a single apical-median spine; tibia with three spine-tipped tubercles on either side; tarsus with two on either side. Palpal claw simple, smooth. Chelicerae normal in size with numerous long hairs at the distal portion of each second segment.

All segments of the legs with many investing hairs which are most numerous on the tarsi. Femora, patella, tibiae, and metatarsi of legs I-III rounded, with numerous hair-tipped tubercles. Metatarsi and tarsi more slender. Femur, tibia, and metatarsus of leg IV elongate; metatarsus with several larger spinose tubercles scattered along its length. Tarsal segments: 3-7-5-6.

Dorsal color uniform reddish-brown, dorsal areas slightly darker, venter slightly lighter. Trochanters of legs, palpi, and chelicerae much lighter, contrasting with the dorsum. Tubercles of the dorsum are lighter in some specimens. The individual opiliones often appear to be a bright reddish-brown with strongly contrasting yellow trochanters and eye tubercle spine. This coloration makes the species quite distinctive.

Female.—Total length of body, 4.1 mm; cephalothorax length, 1.3 mm; width of body at widest portion, 3 mm. Similar in appearance to male, but lacking the elongate fourth legs.

Type data.—Two males, two females, San Isidro, Puntarenas. A type specimen was not indicated by Banks. MCZ, examined.

Additional records.—Santa Maria Dota, Uricuzjo, Atenas, La Bolca (Banks' records); La Palma, one male, one female (Roewer's record) NHMS, examined; Alajuela, finca near San Roman, 13 July 1976, one male, five females, two immatures; Guanacaste, Monteverde, 23 June 1976, two males, three females; Puntarenas, Nicoya Peninsula, fields near Cabuya, 9 July 1976, one male, two females; Puntarenas, Nicoya Peninsula, Tambor, 9 July 1976, four females, three immatures; Puntarenas, Nicoya Peninsula, reserve near Cabuya, 9 July 1976, two males, one female, two immatures.

Pachylicus cotoensis, new species
Figs. 73-76

Description of male holotype.—Total length of body, 3.1 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 2.1 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.5-0.4-0.4; Femur 1.2-1.9-1.5-1.8; Patella 0.5-0.8-0.6-0.8; Tibia 0.7-1.5-1.1-1.9; Metatarsus 1.1-1.7-1.8-2.5; Tarsus 0.5-1.1-1.1-1.2; Total 4.3-7.5-6.5-8.6.

Entire dorsum smooth, eye tubercle slightly removed from the anterior margin of the cephalothorax, prolonged into a forward pointing spine. Anterior margin of cephalothorax with a median small spine, with a slightly larger single spine lateral to the median

one on either side. Dorsal areas clearly outlined, each with a median row of low spinose tubercles, median ones larger. Free tergites similarly armed. Tergite III with a single median and two lateral spines; anal operculum with some tubercles. Ventrally, coxal surfaces only roughened; posterior border of coxa III with larger tooth-like tubercles, a larger blunt spine on the posterior lateral border of coxa IV. This spine obscures the spiracles. Free tergites relatively smooth.

Penis a chitinous shaft, 1.5 mm long.

Palpus: trochanter 0.3 mm long; femur, 0.6; patella, 0.3; tibia, 0.5; and tarsus, 0.5. Total length, 2.2 mm. Palpus with a smooth surface; tibia and tarsus enlarged, almost bulbous. Tarsus with an unusual fleshy protuberance at the proximal median surface. Femur and patella each with an apical-median spine.

All segments of the legs with hairs and a roughened appearance. Trochanters with various spines and tubercles as illustrated. Femur, patella, and tibia of leg I somewhat enlarged. Tarsal segments: 3-9-5-6.

Dorsum reddish-brown in color. Palpi, chelicerae, and trochanters and tarsi of legs much lighter. Tip of spine of eye tubercle also lighter.

Female.–Total length of body, 3.5 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 2 mm. Length of femora: 1.1 mm-1.7 mm-1.3 mm-1.6 mm. Similar in appearance to the male, but lacking the fleshy protuberance of the palpal tarsus and the enlarged segments of leg I.

Type data.–Male holotype, male paratype, and three female paratypes from Coto, Puntarenas, 30 August 1957 (E. Dixon).

Remarks.–This species differs from the other members of this genus chiefly by its possession of the unusual fleshy protuberance on the palpal tarsus.

Pachylicus foveolatus, new species
Figs. 77-80

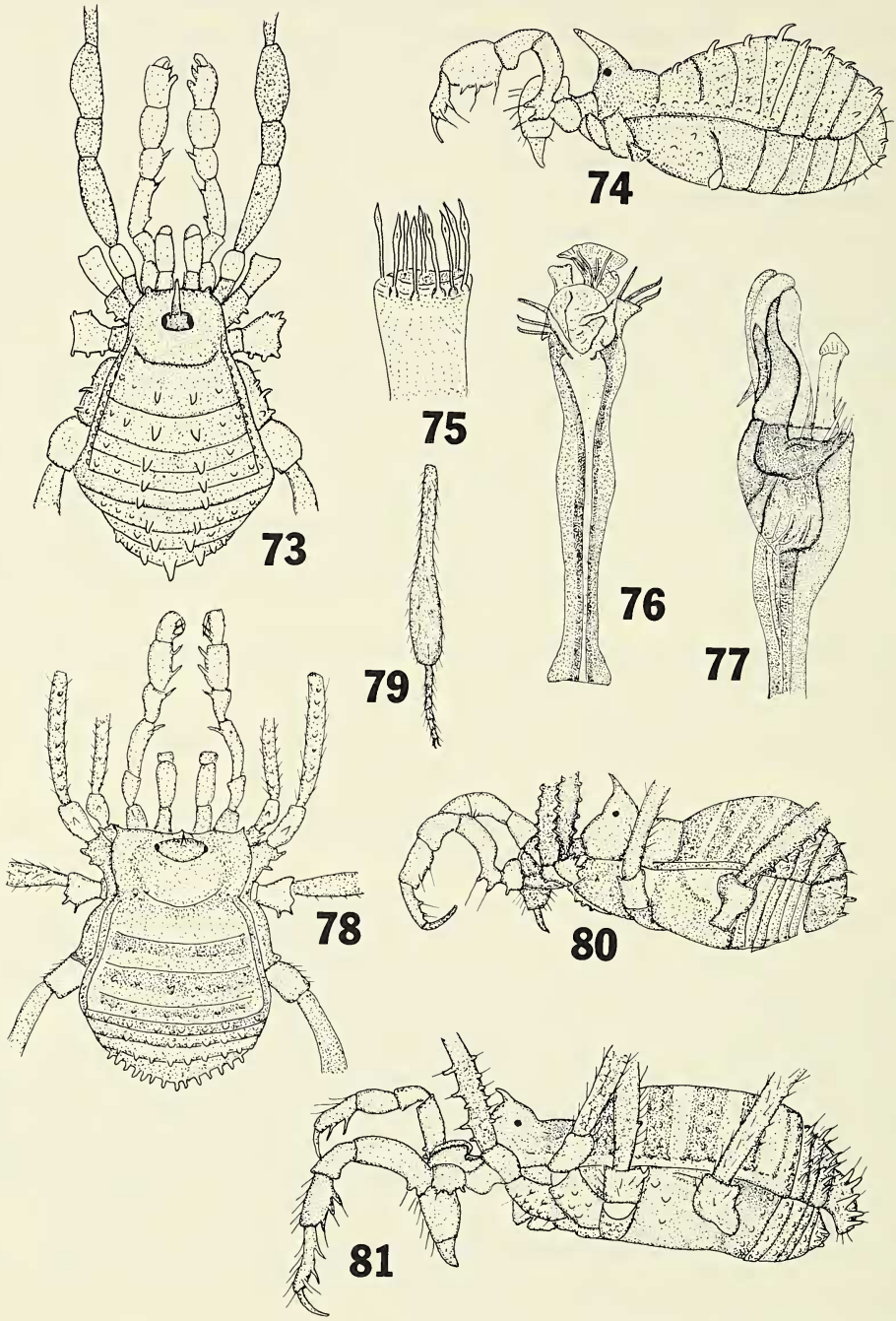
Description of male holotype.–Total length of body, 3 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 2.2 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.3-0.5; Femur 0.9-1.5-1.2-2.2; Patella 0.5-0.7-0.4-0.9; Tibia 0.7-1.3-0.9-1.9; Metatarsus 1.1-1.6-1.3-2.5; Tarsus 0.7-0.9-0.8-0.9; Total 4.2-6.4-4.9-8.9.

Dorsum, including cephalothorax smooth; eye tubercle slightly removed from the anterior margin of the cephalothorax, terminating in a sharp dorsal spine. Dorsal areas clearly defined by darker markings. Each dorsal area with a transverse row of low tubercles which are somewhat larger on the fifth area. Each free tergite with a transverse row of low spines which are somewhat more conspicuous on tergite III. Coxae, genital operculum, and free sternites smooth. Coxa II with a small spine on the posterior distal portion, a few low tubercles on the posterior margin of coxa II. Coxa IV with some spinose hairs, spiracle partially concealed by coxa IV. Free sternites smooth, dorsal portion of anal operculum with a few low spines.

Penis 0.96 mm long, a slender, sclerotized shaft.

Palpus: trochanter, 0.4 mm long; femur, 0.5; patella, 0.4; tibia, 0.5; and tarsus, 0.3. Total length, 2.1 mm. Palpus armed as in figure; femur with a median apical spine. Chelicera not enlarged.

Trochanters of legs smooth, with a few low spines on the posterior border of trochanter III. Femora, patellae, and tibiae rounded; metatarsi slender; all segments with



Figs. 73-76.–*Pachylicus cotoensis*, new species: 73, dorsal view of male; 74, lateral view of male; 75, distal portion of ovipositor; 76, dorsal view of penis.

Figs. 77-80.–*Pachylicus foveolatus* new species: 77, lateral view of distal portion of penis; 78, dorsal view of male; 79, metatarsus and tarsus of leg IV of male; 80, lateral view of male.

Fig. 81.–*Pachylicus hirsuta* Roewer: 81, lateral view of male.

numerous hairs. Femora of legs I, II, and IV with larger spinous tubercles; distal portion of metatarsus IV enlarged. Tarsal segments: 3-7-5-6.

Dorsum, femora, patellae, tibiae, and metatarsi of legs reddish-brown; venter, trochanters, and tarsi of legs as well as chelicerae and palpi lighter. Trochanters contrasting strongly with the dorsum in color. Distal portion of tibiae and proximal portion of metatarsi somewhat lighter.

Female.–Total length of body, 2.7 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.7 mm. Similar in appearance to male, but lacking the enlargement of metatarsus IV.

Type data.–Male holotype, two female paratypes, and three immatures from Manuel Antonio National Park, Puntarenas, 19 and 21 June 1976. These animals were found among the dead and decaying leaves on the ground.

Remarks.–*Pachylicus foveolatus* differs from the other species of this genus in its secondary sexual characters and the form of the eye tubercle.

Pachylicus hirsutus (Roewer), new combination
Figs. 82-84

Brimma hirsutus Roewer 1949a:19, figs. 16a-f.

Description of male.–Total length of body, 2.4 mm; cephalothorax length, 0.85; width of body at widest portion, 1.75 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.3-0.3-0.4; Femur 0.7-1.1-1.0-3.0; Patella 0.4-0.5-0.4-1.1; Tibia 0.6-1.0-0.8-3.2; Metatarsus 0.8-1.1-1.1-2.6; Tarsus 0.6-1.0-0.7-0.9; Total 3.3-5.0-4.3-11.2.

Cephalothorax somewhat narrow, abdomen wider. Dorsum smooth, the legs with spinose hairs which give the animal a somewhat hirsute appearance. Eye tubercles dorsally with a forward pointing spine, eyes at base. Each free tergite with a transverse row of hair-tipped low spines. Dorsal portion of anal operculum with numerous small hair-tipped spines. Ventral surfaces of coxae and genital operculum quite smooth. Coxa II with small spines at the distal posterior portion; coxa III with a posterior row of low tubercles. Spiracles partially concealed by a short dorsal spine from trochanter IV. Free sternites smooth, ventral portion of anal operculum with spines.

Penis 0.9 mm long, complex in appearance.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.2; tibia, 0.4; tarsus, 0.2. Total length, 1.4 mm. Palpus armed as in figure. Basal segment of chelicera with a slight dorsal enlargement.

All segments of legs, including the coxae, with spinose hairs. Tarsal segments:3-6-5-5. Femora, patellae, and tibiae of legs I-III slightly enlarged. Femur of leg I with spinose tubercles arranged as in figure. Femur IV elongate, with a low spine at the apical portion. Metatarsus IV somewhat curved with a small apical spine.

Color of entire animal light yellow brown, dorsal areas of abdomen with darker central areas. Trochanter of legs somewhat lighter, remainder legs concolorous with the dorsum. Cephalothorax with black pencillings, palpi likewise netted with darker pencillings.

Female.–Total length of body, 2.5 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.8 mm. Length of femora: 0.65 mm-0.9 mm-0.9 mm-1.05 mm. Similar in general appearance to the male. The chief difference is to be noted in the length of the femora. Femur IV, particularly, is much shorter. The femora, patellae, and tibiae are somewhat more spinose in appearance than those of the male.

Type data.—Male holotype from Waldeck Farm, 45 km northwest of Limon, Limon (Roewer's record), NHMS, examined.

Additional records.—Puntarenas, Coto, 27 October 1957 (E. Dixon), one male, two females, eight immatures; Puntarenas, Golfito, 20 October 1957 (E. Dixon), one male, one female, one immature; Puntarenas, Agua Buena, 27 October 1957 (E. Dixon) one male; Puntarenas, Corredor, 20 October 1957 (E. Dixon) one male; Puntarenas, Las Cruces near San Vito, 1 August 1975, one male, one female; Puntarenas, Llorona, Osa Peninsula, 9 August, 1978, one male.

Remarks.—While most of the male specimens examined exhibited the usual elongate fourth leg, the male from Agua Buena had a much shorter fourth leg, with the femur being only 1.5 mm long.

Pachylicus hispidus, new species
Figs. 85-87

Description of male holotype.—Total length of body, 2.8 mm; cephalothorax length, 0.8 mm; width of body at widest point, 1.6 mm cephalothorax length, 0.8 mm; width of body at widest point, 1.6 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.4-0.4; Femur 1.3-1.9-1.4-1.8; Patella 0.4-0.6-0.5-0.7; Tibia 0.8-1.7-1.1-0.9; Metatarsus 1.6-1.9-1.5-2.1; Tarsus 0.5-2.1-1.0-1.4; Total 4.9-8.6-5.9-7.3.

Cephalothorax smooth, eye tubercle slightly removed from anterior margin, with a short spine projecting upward. Eyes large at base. Anterior margin of cephalothorax with a small projection in center and one on each side just laterad to the chelicerae. Dosal areas not clearly defined, each with a transverse irregularly placed row of low hair-bearing tubercles. Free tergites with similar rows of tubercles, a few scattered ones on the anal operculum. Venter with all portions having hair-bearing low tubercles. Coxa II with a few larger tubercles at the anterior portion, similar tubercles on the posterior margin. Coxa IV with some large hair-bearing tubercles on the dorsal area, those of the ventral portion smaller. Each free sternite with a transverse row of hair-bearing low tubercles; anal operculum with numerous hair-bearing tubercles. Spiracle partially concealed by coxa IV.

Penis 1.2 mm long, with a distinctive configuration as illustrated.

Palpus: trochanter, 0.2 mm long; femur, 0.7; patella, 0.5; tibia, 0.5; tarsus, 0.6. Total length, 2.5 mm. Palpal segments quite smooth with ventral spines. Femur and patella each with an apical median spine. Chelicerae small, second segment of each with several hair-bearing tubercles.

All segments of the legs but the tarsi roughly tuberculate, clothed with many hairs. Tarsal segments: 3-7-5-6.

Color of dorsum and venter a uniform yellow brown; palpi and chelicerae and trochanters of legs somewhat lighter than the dorsum.

Female.—Total length of body, 2.8 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.6 mm. Nearly identical in appearance with male, no apparent sexual dimorphism present. Ovipositor as illustrated.

Type data.—Male holotype and female paratype from interior of La Cueva de Damas, near Manuel Antonio National Park, Puntarenas 22 June 1976.

Remarks.—The most distinctive feature of this species is the general spinose appearance. Although they were collected from within a cave, they showed no special adaptions for cave life.

Pachylicus spinatus, new species
Figs. 88-92

Description of male holotype.–Total length of body, 2.5 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.9 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.1-0.4-0.4-0.4; Femur 0.9-1.7-1.2-3.1; Patella 0.4-0.7-0.4-0.8; Tibia 0.8-1.4-1.1-2.7; Metatarsus 1.1-1.7-1.5-3.5; Tarsus 0.8-1.2-0.8-0.8; Total 4.1-7.1-5.4-11.3.

Cephalothorax narrow, with a small spine on each side of the anterior margin. Eye tubercle removed from the anterior margin, with a forward pointing median spine and with two small spines behind the eye tubercle. Five dorsal areas distinct; all areas and free tergites armed as in figure. These spines are tipped with spinose hairs; the spines are somewhat larger on the free tergites than on the dorsal areas. Venter somewhat granulate, but with only a few conspicuous tubercles. A few of these are located on the posterior border of coxa III and a single large one is on the posterior portion of coxa IV. Anal operculum with blunt spines similar to those of the free tergites. Spiracle hidden.

Penis with a very complex structure, as in figure.

Palpus: trochanter, 0.2 mm long; femur, 0.4; patella, 0.3; tibia, 0.4; and tarsus, 0.2. Total length, 1.5 mm. Palpus armed as in figure; both femur and patella with anterior median spines; tibia slightly enlarged ventrally. Chelicerae small, with some hairs.

Trochanter and coxae of legs with some spines; femora of legs I, II, and IV with larger spines which are somewhat larger at the distal portion of femur IV. Femora, patellae, and tibiae rounded, larger in diameter than the metatarsi and tarsi. All segments with numerous hairs. Tarsal segments: 3-6-5-5.

Color of body uniform brown. Palpi and trochanters of legs somewhat lighter; distal portion of metatarsi and tarsi of palpus lighter. Spines of dorsum also light brown in color.

Female.–Total length of body 2.9 mm; cephalothorax, 0.8 mm; width of body at widest portion, 2.1 mm. Similar in appearance to male, but with the femur and tibia of leg IV much shorter, with the femur being 1.7 mm long and the tibia 1.5 mm. Ovipositor with a blunt double anterior portion and with several large spines as illustrated.

Type data.–Male holotype, male paratype, and two female paratypes from Llorona, Osa Peninsula, Puntarenas, 9 August 1978.

Additional record.–Puntarenas, Osa Peninsula, Swamp trail, Llorona, 23 August 1979, one male.

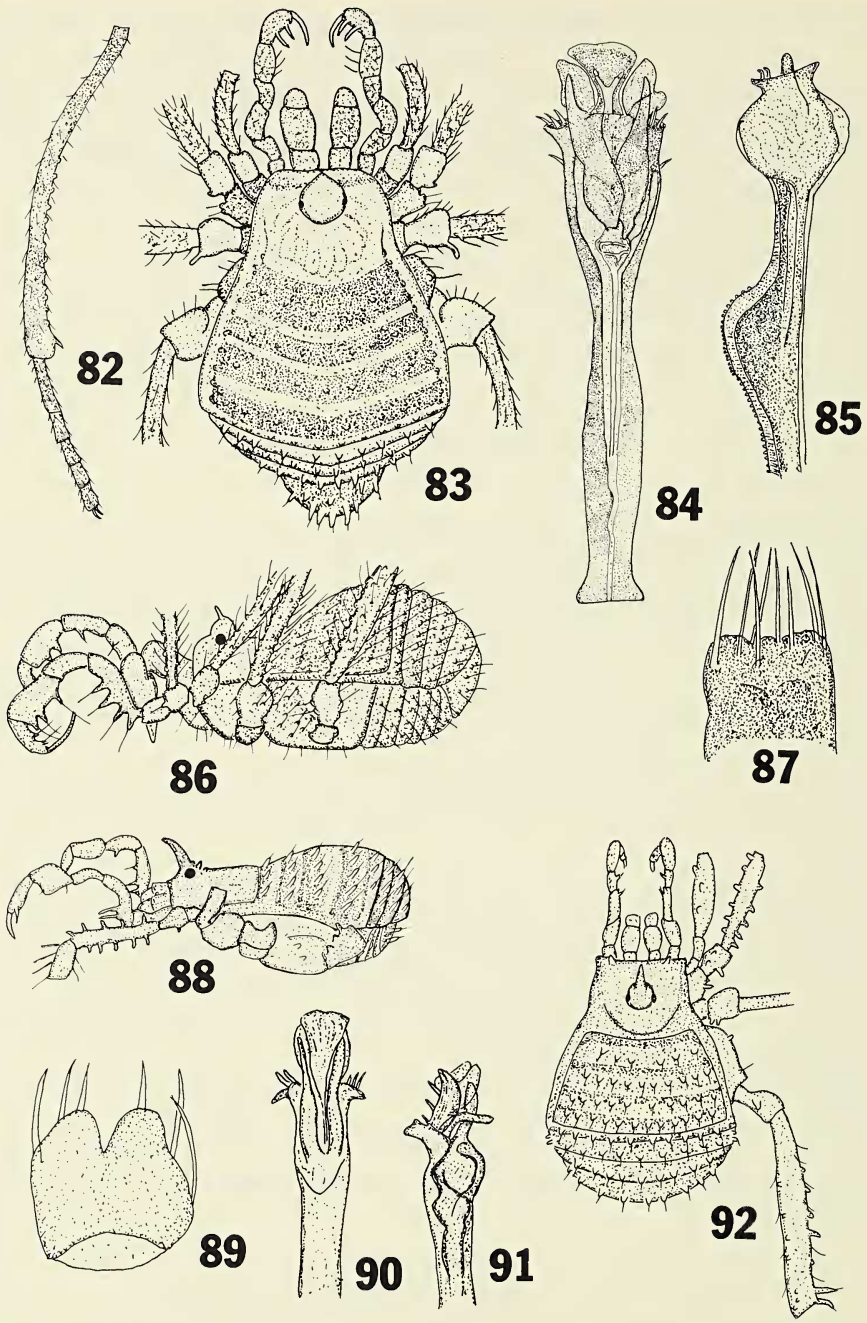
Remarks.–This species is related to *Pachylicus rugosus* but the appearance of the eye tubercle, the numbers of the tarsal segments, and the structure of the male penis all clearly differentiate it.

Panopiliops Roewer

Panoplia Roewer 1949a:42 (nec *Panoplia* Huebner 1925).
Panopiliops Roewer 1949c:144 (replacement name).

Type species.–*Panopiliops reimoseri* (Roewer).

Diagnosis.–Medium sized phalangodids with the eye tubercle slightly removed from the anterior margin of the cephalothorax, rounded, and with a single dorsal spine. Dorsum with five areas, the borders of which are parallel; first area without a median line. Tarsal segments 4-more than 6-5-5 or 6. Metatarsi without astraguli or calcanei. Tarsal



Figs. 82-84.–*Pachylicus hirsuta* Roewer: 82, tibia and tarsus of leg IV of male; 83, dorsal view of male; 84, ventral view of penis.

Figs. 85-87.–*Pachylicus hispidus*, new species: 85, lateral view of distal portion of penis; 86, lateral view of male; 87, distal portion of ovipositor.

Figs. 88-92.–*Pachylicus spinatus*, new species: 88, lateral view of male; 89, distal portion of ovipositor; 90, dorsal view of distal portion of penis; 91, lateral view of distal portion of penis; 92, dorsal view of male.

claws of tarsi III and IV double, smooth, arising independently. Distitarsi of legs I and II, 2 and 3 respectively.

Remarks.–At present there are but two species in this genus.

Panopiliops reimoseri (Roewer)
Figs. 93-96

Panoplia reimoseri Roewer 1949a:42, figs. 74a-e.
Panopiliops reimoseri Roewer 1949c:144.

Description of male.–Total length of body, 2.8 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 1.9 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.3-0.4-0.4-0.6; Femur 1.4-2.6-2.2-5.5; Patella 0.5-0.6-0.6-1.0; Tibia 1.1-2.0-1.6-4.9; Metatarsus 1.5-2.8-2.5-5.8; Tarsus 0.6-1.9-1.1-1.4; Total 5.4-10.3-8.4-19.2.

Cephalothorax smooth, eye tubercle slightly removed from the anterior margin, with a dorsal sharp spine; anterior margin of cephalothorax smooth. Abdominal surface smooth except for a few low tubercles on the lateral margins and paired spines on the median portion of the dorsal areas. These are small on the first area and become progressively larger on the posterior areas with those of the fourth area being the largest; those of the fifth area are somewhat smaller. A few smaller tubercles also present laterad to the median spines of the fifth area. First free tergite with a horizontal row of low tubercles, with the central ones somewhat larger. Spines of the second and third free tergites much larger; several large spines present on the anal operculum. Venter slightly granulate, coxa I with a few larger hair-tipped tubercles on the anterior border. Coxa III with a few teeth on the anterior and posterior borders. Coxa IV with several low spine-tipped tubercles. Each free sternite with a transverse row of every low tubercles. Spiracle partially concealed.

Penis as illustrated.

Palpus: trochanter, 0.1 mm; femur, 0.5; patella, 0.4; tibia, 0.4; tarsus, 0.4. Total length, 1.8 mm. Palpus armed as in figure. Femur and patella each with an apical median spine. Chelicera not enlarged.

All segments of legs smooth. Femur I with somewhat enlarged tubercles. Tarsal segments: 4-7-5-6.

Color of entire body light reddish-brown, trochanters of legs lighter.

Female.–Total length of body, 2.8 mm; cephalothorax length, 0.8 mm; width at widest portion, 2.2 mm. Similar in appearance to male but with shorter legs. Femora: 1.1 mm-1.8 mm-1.5 mm-2.5 mm. Total length of legs: 4.3 mm-7.5 mm-6.1 mm-9.6 mm.

Type data.–Male holotype and female paratypes from Hamburg Farm, 20 km north of Siquirres, Limon (Roewer's record), NHMS, female paratype examined.

Additional records.–Cartago, Turrialba, 22 July 1976, three males, three females; Heredia, Finca La Selva, 25 September 1979 one male.

Panopiliops inops, new species
Figs. 97-100

Description of female holotype.–Total length of body, 2.9 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 1.8 mm. Length of legs (I-II-III-IV in mm):

Trochanter 0.3-0.4-0.4-0.4; Femur 1.1-1.6-1.1-1.6; Patella 0.4-0.7-0.5-0.6; Tibia 0.8-1.3-0.9-1.4; Metatarsus 1.0-1.4-1.1-1.5; Tarsus 0.7-1.6-1.0-1.0; Total 4.3-7.0-5.0-6.5.

Entire body surface, including all segments of legs but the tarsi with numerous low granulations. Eye tubercle on the anterior margin of the cephalothorax, without eyes, with a sharply pointed spine at the apex and with numerous larger tubercles present at the base of the spine. Dorsal areas not clearly indicated. Free tergites and anal operculum with numerous low granulations which are somewhat larger on the third free tergite and the anal operculum. All ventral surfaces with granulations less abundant on the genital operculum and largest on coxa IV. Spiracle concealed by low spines from coxa IV.

Ovipositor as illustrated.

Palpus: trochanter, 0.3 mm long; femur, 1.0; patella, 0.4; tibia, 0.7; and tarsus 0.5. Total length, 2.9 mm. Palpus with spines as illustrated. Femur and patella each with an apical-median spine. Proximal segment of chelicera with small dorsal elevation. Both chelicera and palpus somewhat smoother than remaining portions of the body.

Legs slender, all segments but the tarsi with low granulations, some larger ones present on the trochanters. Many hairs present on all segments. Tarsal segments: 4-7-5-5. Femur IV slightly curved, first tarsal segment of leg III elongate.

Entire animal very light yellow, appendages somewhat lighter.

Type data.—Female holotype from Coto, Puntarenas, 7 May 1957 (E. Dixon).

Remarks.—Though the label does not indicate that this specimen was collected in a cave, it has the typical appearance of cave adapted species including the lack of eyes, the pale coloration, and the slightly elongated appendages.

It differs from *P. reimoseri* in its general appearance, particularly in its possession of cave-adapted features.

Phalangoduna Roewer

Phalangoduna Roewer 1949a:33.
Sempalus Roewer 1949a:41. **NEW SYNONYMY.**

Type species.—*Phalangoduna granosa* Roewer.

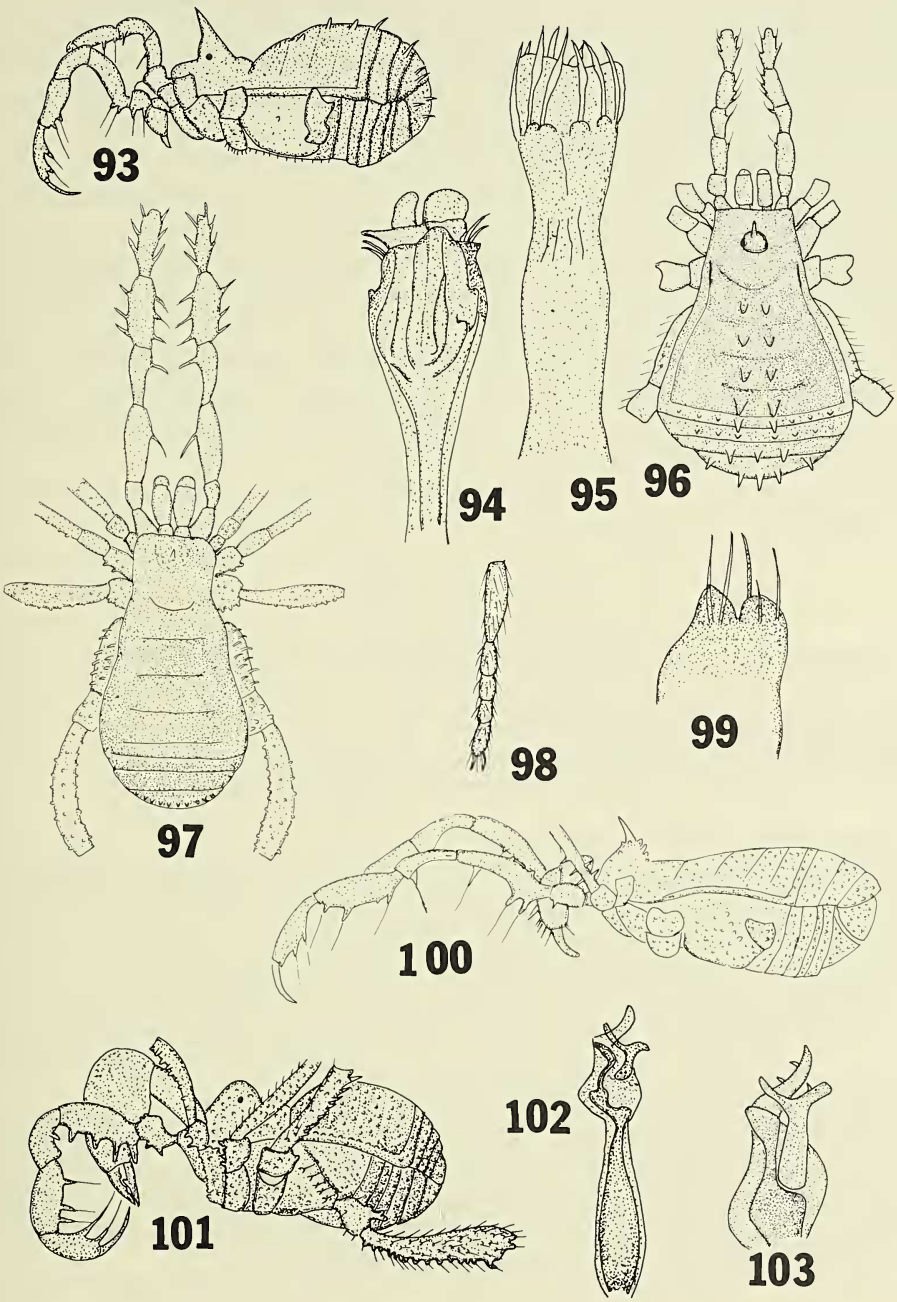
Diagnosis.—Phalangodids of medium size, eye tubercle located on anterior margin of cephalothorax. Dorsum with five areas, first without median line, borders parallel. Spiracles partially concealed by portions of coxae IV. Tarsal segments: 4-6-5-5. Distitarsus of first tarsus with two segments, second with three. Metatarsi without astraguli or calcanei; tarsal claws of legs III and IV, arising independently, double, untoothed.

Phalangoduna granosa Roewer
Figs. 101-103

Phalangoduna granosa Roewer 1949a:33, figs. 52a-e.
Sempalus setulosus Roewer 1949a:41, figs. 70a-e. **NEW SYNONYMY.**

Description of male holotype.—Total length of body, 2.6 mm; cephalothorax length, 0.75 mm; width of body at widest portion, 1.8 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.3-0.4-0.4; Femur 0.8-2.2-1.2-1.6; Patella 0.4-0.6-0.5-0.7; Tibia 0.7-1.3-1.0-1.4; Metatarsus 1.1-1.5-1.5-1.9; Tarsus 0.6-0.9-0.7-1.0; Total 3.8-6.8-5.3-7.0.

A relatively small animal, entire surface of dorsum very granulate; eye tubercle located on anterior margin of the cephalothorax, rounded above, with numerous granulations.



Figs. 93-96.–*Panopiliops reimoseri* (Roewer): 93, lateral view of male; 94, dorsal view of tip of penis; 95, tip of ovipositor; 96, dorsal view of male.

Figs. 97-100.–*Panopiliops inops*, new species: 97, dorsal view of female; 98, tarsus of leg III of female; 99, distal portion of ovipositor; 100, lateral view of female.

Figs. 101-103.–*Phalangoduna granosa* Roewer: 101, lateral view of male; 102, distal portion of penis; 103, distal portion of penis enlarged.

Anterior margin of cephalothorax with three small tubercles at the lateral margin. Abdomen arched slightly, areas visible, all dorsal areas with numerous granulations. Free tergites likewise with granulations. All ventral areas granulate, coxa II with a posterior row of slightly enlarged tubercles; coxa III with anterior and posterior rows of tooth-like granulations. Coxa IV with conspicuous granulations.

Penis a somewhat rounded shaft, 1.08 mm long.

Palpus: trochanter, 0.3 mm long; femur, 0.9; patella, 0.4; tibia, 0.7; nd tarsus, 0.7. Total length, 3 mm. Palpus armed as in figure.

Legs with numerous granulations, trochanters with heavier hair-tipped granulations which are also present on the femora, patellae, and tibiae. Metatarsi and tarsi clothed with numerous hairs. Tarsal segments: 4-6-5-5.

Entire dorsum and appendages light yellow brown; tarsi of legs somewhat lighter.

Type data.—Male holotype from La Palma (Roewer's record), NHMS, examined.

Additional record.—Darien, Panama (Roewer's record), NHMS, not examined. This record is of the female holotype of *Sempalus setulosus.*

Remarks.—A close study of the descriptions of these two species convinces us that they are identical.

Stygnoleptes Banks

Stygnoleptes Banks 1914:682; Roewer 1939:160; Goodnight and Goodnight, 1947b:2.
Chersobleptes Soerensen 1932:271. **NEW SYNONYMY.**
Mochlus Roewer 1933:280 (Nec *Mochlus* Gunther 1864). **NEW SYNONYMY.**
Piercenia Roewer 1934:304. **NEW SYNONYMY.**
Cippanus Roewer 1933:278. Goodnight and Goodnight 1942c:1. **NEW SYNONYMY.**
Cynortina Goodnight and Goodnight, 1953:14 (in part). **NEW SYNONYMY.**

Type species.—*Stygnoleptes analis* Banks.

Diagnosis.—Small animals having a low eye tubercle which is slightly removed from the anterior margin of the cephalothorax. Dorsum with five areas, first without a median line, margins of areas parallel. Tarsal segments variable in number: 3-6-4-5; 3-6-5-5; or 3-5-4-5. Distitarsus of first tarsus with two segments, second with three. Tarsi of third and fourth legs without scopulae, double claws smooth, arising individually. Metatarsi not divided into astraguli or calcanei. Male penis is a sclerotized shaft. Secondary sexual characteristics consisting chiefly of increased spination of legs, presence of a spine on the anal operculum, and enlarged basal segments of the tarsi of the males.

Remarks.—This genus is closely related to *Parascotolemon* Roewer, differing chiefly in the number of tarsal segments and general appearance. Though described in 1913 by Banks, this genus has been described several times under other names by other workers; possibly this is due to the lack of recognition by other workers of the considerable variation that exists among the individuals of the single species.

Stygnoleptes analis Banks
Figs. 108-110

Stygnoleptes analis Banks 1914:682 pl. 28, figs. 6, 13; Roewer 1931:160, fig. 25; Goodnight and Goodnight 1947b:3, figs. 7-10.
Chersobleptes bovelli Soerensen 1932:271-272. **NEW SYNONYMY.**
Mochlus ventralis Roewer 1933:280, fig. 4. **NEW SYNONYMY.**
Cippanus calcartibialis Roewer 1933:278, fig. 2. **NEW SYNONYMY.**
Cippanus adornus Goodnight and Goodnight 1942c:1, figs. 5-9. **NEW SYNONYMY.**

Description of male.–Total length of body, 2.6 mm; cephalothorax length, 0.7 mm; width of body at widest portion, 1.2 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.2-0.2-0.3; Femur 0.5-0.8-0.8-1.0; Patella 0.3-0.4-0.2-0.4; Tibia 0.4-0.8-0.5-0.8; Metatarsus 0.5-0.9-0.8-1.2; Tarsus 0.4-0.8-0.5-0.8; Total 2.3-3.9-3.0-4.5.

A small animal, cephalothorax somewhat narrower than the abdomen, body arched. Eye tubercle low, rounded. Dorsal areas poorly defined. Both cephalothorax and abdomen with only a few granulations on the lateral borders. Free tergites smooth, a small spine present on either side of the third and sometimes on the second. Ventral surfaces likewise smooth. Coxa III with a few anterior and posterior low tubercles; IV with some low tubercles on the anterior surface. Anal operculum usually with a large median spine. Spiracles partially concealed by low tubercles of the first free sternite.

Penis 0.8 mm long, with soft portions extending from the sclerotized portions.

Palpus: trochanter 0.2 mm long; femur, 0.3; patella, 0.2; tibia, 0.3; and tarsus, 0.2. Total length, 1.2 mm. Chelicera not enlarged.

All segments of legs with investing hairs. First segment of tarsus III enlarged; femur III with some spinose tubercles; tibia IV with spines as illustrated.

Entire dorsum deep reddish-brown; chelicera and palpus very light yellow. Legs marked as follows: leg I, trochanter and femur (except for distal portion) and distal tarsal segments light, remainder of leg darker; leg II similar to I but with tarsal segments 1 and 6 dark, others light; leg III similar to leg II with tarsal segment II darker; leg IV with the trochanter and femur light above and dark below, patella and tibia dark, spines of tibia light, metatarsus and tarsus dark.

Female.–Total length of body, 2.2 mm; cephalothorax length, 0.7 mm; width of body at widest portion, 1.6 mm. Similar in appearance to male but lacking the enlarged spine of the anal operculum and the enlarged basal segments of tarsus III. Ovipositor with a bilobed tip and a few bristle-like spines.

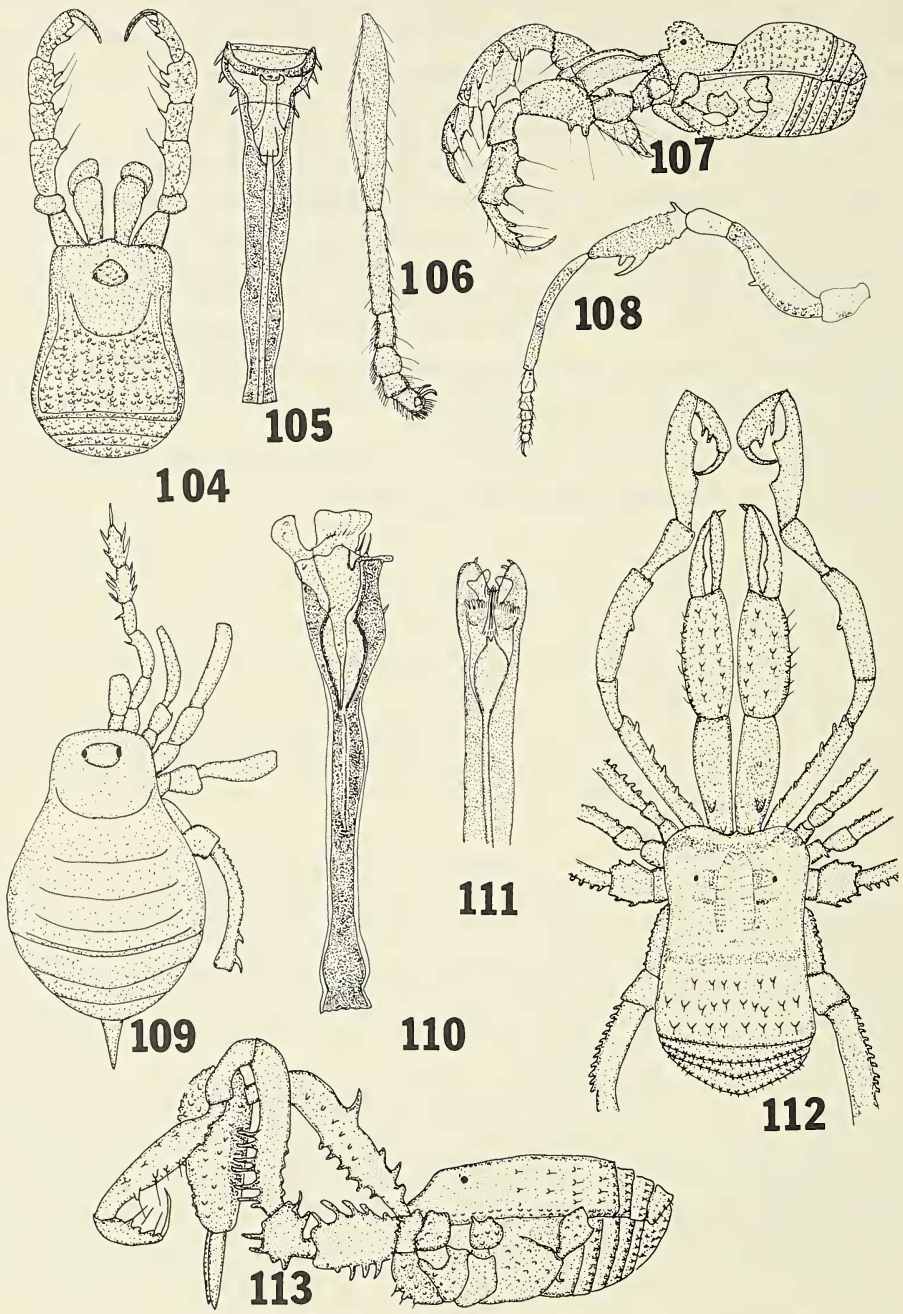
Type data.–Male holotype from Turrialba, Cartago (Banks' record), MCZ, examined.

Additional records.–Limon, Hamburg Farm 20 km N of Siquirres, five males, two females (Roewer's records of *Cippanus calcartibialis* and *Mochlus ventralis*); Costa Rica, one male (Soerensen's record for *Chersobleptes bovelli*), NRS, examined; Guanacaste, Monteverde, Sendero Brillante, 10 July 1978, one male; Panama, Barro Colorado Island 4 August 1938 (E. C. Williams, Jr.), AMNH, examined, one male, one female (*Cippanus adornus* Goodnight and Goodnight).

Remarks.–A study of the various specimens has demonstrated that there is considerable variation in the number of tarsal segments as well as the nature of the secondary sexual characteristics of the males. This has, in part, lead to the numerous descriptions. While the spination of tibia IV remains quite constant, the enlargement of tarsal segments appears to vary. Roewer noted that the male specimen which he studied from Hamburg farm *(C. calcartibialis)* had the basal segments of tarsi II and III enlarged. Likewise there is considerable variation in the size of the spine of the anal operculum. In some it is very large and conspicuous, in others, it is much less enlarged. Also the small spines of the free tergites may vary in size and number. The tarsal segments also vary as noted above.

Stygnomma Roewer

Phalangodes Packard 1888:52 (in part).
Scotolemon Banks 1901:671 (in part).
Neoscotolemon Roewer 1912:149 (in part); 1923:112 (in part).



Figs. 104-107.–*Pellobunus insularis* Banks: 104, dorsal view of male; 105, dorsal view of penis; 106, metatarsus and tarsus of leg III of male; 107, lateral view of male.

Figs. 108-110.–*Stygnoleptes analis* Banks: 108, lateral view of leg IV of male; 109, dorsal view of male; 110, lateral view of penis.

Figs. 111-113.–*Stygnomma fuhrmanni* Roewer: 111, ventral view of penis; 112, dorsal view of male; 113, lateral view of male.

Stygnomma Roewer 1914:155; 1923:244; 1949b:256; Petrunkevitch 1925:62; Goodnight and Goodnight 1951:3.
Zygobunus Chamberlin 1925:245; Roewer 1927:545; 1949b:256; Goodnight and Goodnight 1942c: 4.
Stygnommatiplus Roewer 1927:543.
Poascola Roewer 1933:281, 1949b:256.
Antagona Goodnight and Goodnight 1942a:6.
Citranus Goodnight and Goodnight 1942a:4.
Rula Goodnight and Goodnight 1942b:13; 1945:62.
Flaccus Goodnight and Goodnight 1947a:9.

Type species.–*Stygnomma fuhrmanni* Roewer.

Diagnosis.–Medium to large animals without a common eye tubercle, with five dorsal areas; first area without a median line, borders parallel. Tarsal segments somewhat variable in number, all usually numbering more than six, though the first may vary from four to eight. Distitarsus of tarsus I with two segments; tarsus II with three. Tarsi of legs III and IV without scopulae and with simple untoothed claws which arise independently. Femur of leg I normal in size; metatarsus of leg III not divided into astraguli or calcanei. Palpus and chelicera of male often enlarged, degree of enlargement varying with the individual specimen. Secondary characteristics of the male usually consisting of increased size and spination of the palpus and usually some enlargement of a portion of metatarsus III.

Remarks.–Species within this genus are separated on the basis of size, general body configuration, secondary sexual characters, and spination. Though the members of this genus are widespread in their distribution, they are not commonly found. *S. fuhrmanni* is the southernmost representative of the genus and is easily recognized when found. Because of its unusual appearance, it does attract attention and possibly this accounts for its being described so many times.

In our paper (1951) we concluded that members of this genus should be included in the subfamily Phalangodidae. Roewer and other authors had considered them to be in a separate subfamily based on their lack of an eye tubercle. We felt, at that time, that this was too variable a trait to be used for separation of subfamilies; for we had specimens which showed a condition intermediate between having and not having an eye tubercle.

Stygnomma fuhrmanni Roewer
Figs. 111-113

Stygnomma fuhrmanni Roewer 1914:155, pl. 8, fig. 7, 1923:245; Goodnight and Goodnight, 1951:4, figs. 1-3.
Stygnomma rufum Petrunkevitch 1925:62.
Stygnomma armatum Petrunkevitch 1925:63, fig. 1.
Zygobunus barronus Chamberlin 1925:245; Roewer 1927:546; Goodnight and Goodnight 1942c:4, figs. 10-12.
Stygnommatiplus rufus Roewer 1927:546.
Stygnommatiplus armatum Roewer 1927:544, fig. 6.
Poascola reimoseri Roewer 1933:281, fig. 5.

Description of male.–Total length of body, 4 mm; width of body at widest point, 2.6 mm; cephalothorax length, 1.8 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.8-1.1-0.9-1.1; Femur 3.4-4.2-4.1-4.8; Patella 1.1-1.3-1.5-1.4; Tibia 3.2-3.2-4.6-3.9; Metatarsus 4.8-6.5-4.1-5.8; Tarsus 2.7-5.5-2.7-3.4; Total 16.0-21.8-17.9-20.4.

A large animal, dorsum covered with low hair-tipped tubercles which are less conspicuous on the cephalothorax and are arranged in rows on the dorsal areas and along the sides of the dorsum, free sternites, and tergites. Eyes widely separated, placed directly on the cephalothorax, well removed from the anterior margin and with a very low elevation between them. Five dorsal areas indicated by transverse rows of low tubercles, but not clearly defined. First area without a median line. Each free tergite with a transverse row of low tubercles which are hair-tipped; both portions of anal operculum heavily covered with similar tubercles. Venter with coxae of palpi greatly enlarged, curving forward, spined. Coxa I with a ventral row of three to four large tubercles as well as several low ones; coxa II with numerous tubercles; III with similar tubercles as well as a posterior row of blunt teeth; IV with numerous hair-tipped tubercles, some slightly enlarged. Genital operculum similarly tuberculate; spiracles clearly visible. Free sternites each with a transverse row of hair-tipped tubercles.

Penis a sclerotized shaft, 2.3 mm long.

Palpus: trochanter, 1.1 mm long; femur 4.1; patella, 1.8; tibia, 3.7; and tarsus, 1.5. Total length, 12.2 mm. Retrolateral surface of palpus as in figure; prolateral surface with femur having low tubercles in the median area, tibia with low spines, one approximately in the center, the others at the distal third. Chelicerae greatly enlarged. Ventral surface with numerous spinose projections, distal segments with numerous hair-tipped tubercles.

Trochanter of legs with hair-tipped tubercles, all femora with rows of slightly enlarged tubercles. Femora III and IV slightly heavier than I and II. Tarsal segments: 8-14-6-7.

Color of dorsum venter and most segments of the appendages a uniform reddish-brown. Coxae of legs somewhat lighter, distal portions of tibiae and tarsi lighter.

Female.—Total length of body, 4.9 mm; cephalothorax length, 1.6 mm; width of body at widest portion, 3.3 mm. Similar in appearance to male, but palpus and chelicera not so strongly developed. Palpus only 7.6 mm long. Chelicera and legs likewise shorter. Ovipositor with rounded tip surrounded by 10 heavy spines.

Type data.—Plateau of Camelia, Colombia (Roewer's data) (apparently a male, place of disposition of type was not available to us).

Additional records.—Alajuela, Volcan Poas (Roewer's record for *Poascola reimoseri*); Panama, Barro Colorado Island (*Zygobunus barronus* Chamberlin); one male; Panama Cerro Flores (*Stygnommatiplus rufus* Petrunkevitch) one male; Limon, Bomba 21 July 1976, one male; Puntarenas, Las Cruces near San Vito 1 August 1976, one immature male; Puntarenas, Osa Peninsula, Llorona Ridge Trail, 24 August 1979, one male, one immature; Puntarenas, Manuel Antonio National Park, 18 June 1976, one male, one female; Puntarenas, Osa Peninsula, Llorona Swamp Trail, 9 August 1978, one immature.

Remarks.—This is a widely distributed form which has been described several times. There is considerable variation in the number of tarsal segments in leg I; it may vary from 6 to 8 in this species. Though we tried to fine the place of disposition of the type specimen, we were unsuccessful.

SAMOINAE SOERENSEN

Pellobunus Banks

Pellobunus Banks 1905:22, Roewer, 1912:145, 1923:111; Goodnight and Goodnight, 1947b:2. *Psyctrapus* Roewer, 1933:276; Silhavy 1979:23. **NEW SYNONYMY.**

Type species.–*Pellobunus insularis* Banks.

Diagnosis.–Phalangodids of medium size, eye tubercle slightly removed from the anterior margin of the cephalothorax, low rounded. Dorsum with five areas, first without median line, borders parallel. Spiracles partially concealed. Tarsal segments: 4-6-5-5 or 6. Distitarsus of first tarsus with two segments, second with three. Metatarsi without astraguli or calcanei; tarsal claws of legs III and IV, arising individually, with scopula. Penis a sclerotized shaft.

Remarks.–At present, only three species are known in this genus: *Pellobunus insularis* Banks from Panama and Costa Rica, *Pellobunus haitiensis* (Silhavy) from Haiti, and *Pellobunus insulcatus* (Roewer) from El Salvador. The scopula is not conspicuous in these forms and may be easily overlooked during study.

Pellobunus insularis Banks
Figs. 104-107

Pellobunus insularis Banks 1905:22, figs. 4a-d; Roewer 1912:147; 1923:111; Goodnight and Goodnight, 1947b:2, figs. 14-16.
Psyctrapus metatarsalis Roewer 1933:276, fig. 1. **NEW SYNONYMY.**
Psyctrapus panamensis Silhavy 1979:23-24, figs. 51-55. **NEW SYNONYMY.**

Description of male.–Total length of body, 2.4 mm; cephalothorax length, 0.9 mm; width of body at widest portion, 1.8 mm. Length of legs (I-II-III-IV in mm): Trochanter 0.2-0.2-0.2-0.3; Femur 0.9-1.8-0.8-1.0; Patella 0.4-0.4-0.3-0.4; Tibia 0.6-1.0-0.7-0.3; Metatarsus 0.8-1.1-1.1-0.8; Tarsus 0.4-1.0-0.6-0.8; Total 3.3-5.5-3.7-4.7.

Cephalothorax smooth, only a few low tubercles on and behind the eye tubercle. Eye tubercle slightly removed from the anterior margin of the cephalothorax, low, rounded above. Dorsal areas not clearly defined; dorsum with numerous low tubercles giving the surface a roughened appearance. Entire venter with numerous low tubercles which are present on coxa II as a median row and as scattered tubercles on remaining coxae. Coxa III with an anterior and posterior row of teeth-like tubercles. Each free sternite with a transverse row of tubercles. Anal operculum similarly covered. Spiracles visible, but not widely expanded.

Penis sclerotized shaft, 0.3 mm long.

Palpus: trochanter, 0.2 mm long; femur, 0.7; patella, 0.4; tibia, 0.4; and tarsus, 0.3. Total length, 2 mm. Palpus armed as in figure. The palpi and chelicerae of male are somewhat enlarged.

All segments of legs with hairs, most numerous on the tarsi. Metatarsus II with false articulations; metatarsus III with a median enlargement as in figure. The central elongate area is lighter than the remaining portion of the legs. The function of this structure is not readily apparent, possibly it has a special sensory function. Tarsal segments: 4-6-5-6. Scopulae present on tarsi of legs III and IV.

Entire body and appendages a dark reddish-brown; trochanters lighter. Some black mottlings on the dorsum, presenting a somewhat streaked appearance. The legs, particularly legs I and II are somewhat darker. Darker markings are conspicuous on the palpi. There is some variation in the markings with the specimens from Panama being somewhat darker.

Female.–Total length of body, 2.4 mm; cephalothorax length, 0.8 mm; width of body at widest portion, 1.9 mm. Similar in appearance to the male but lacking the special

structure on metatarsus III; also the chelicerae and palpi are not nearly so enlarged. Ovipositor with rounded anterior end and a few spines around the border.

Type data.—Female holotype from Cocos Island, Costa Rica (Banks' record) MCZ, examined.

Additional records.—Rio Parismina, near the Atlantic Coast, 3 May 1930 (Roewer's record for *Psyctrapus metatarsalis*), NHMS, not examined; Panama: Canal Zone, Summit Gardens, May 1964, 7 males, 6 females; May 1969, one female; Barro Colorado Island, May 1964, seven males, five females; 24 July 1936, one female (all collections by Chickering) (Silhavy's records); Barro Colorado Island, February, 1945; Juan Mina, Canal Zone, March 1945, one female (last two collections by C. D. Michener).

Records.—Though this small phalangodid is easily recognized by the unique structure on the metatarsus of leg III, it has been described three times probably due to the fact that Banks' original description was based upon a single female. In 1947, we redescribed Banks' holotype and listed two identified females from Panama. Roewer (1933) first described the male of this species from Costa Rica. Our examination of the specimens available to us has convinced us that all of them actually represent *Pellobunus insularis* Banks. This again points out the problems that arise when only females are available for study; mistakes result.

Another problem presented by this species is the assigning of it to the subfamily Samoinae. Both Roewer and Silhavy felt that there was a scopula present on tarsi III and IV; this is the main character that distinguishes this subfamily from others of Phalangodidae. We have examined all our specimens carefully, and it is indeed true that the hairs present on these tarsi are heavier and just possibly do represent a scopula. We are abiding by their decision, but reserve the right to question the accuracy of it. It appears important to us to study representatives of this subfamily from Samoa in order better to determine what does constitute true scopula.

ACKNOWLEDGMENTS

Although most of the material studied was collected by us, we do wish to thank a few individuals who kindly made their specimens available to us for study. These include Dr. Francke of Texas Tech University, Lubbock, Texas and Mr. E. Dixon whose material was loaned to us by the State Museum of Florida, Gainesville, Florida. Our son, Charles, was able to collect material from areas which he visited while a student with the Organization of Tropical Studies. We appreciate the effort he made for us.

We also had the good fortune to be able to examine many of Roewer's types from his 1949 studies through the kind offices of Dr. M. Grasshoff of the Natural History Museum of Senckenberg, Frankfurt, West Germany (NHMS). The holotype of Soerensen's species, *Chersobleptes bovelli (= Stygnoleptes analis)* was examined through the courtesy of Mr. Torbjörn Kronestedt of the Naturhistoriska Rikmuseet of Stockholm, Sweden (NRS). Dr. Herbert Levi of the Museum of Comparative Zoology (MCZ) Cambridge Massachusetts loaned us some of Banks' types. Finally Dr. Norman Platnick of the American Museum of Natural History (AMNH) sent us types of some of our species for reexamination.

We are indebted to many kind people in Costa Rica, particularly the personnel of the Organization for Tropical Studies (OTS) who helped us with advice from time to time. In particular we appreciated the fact that the government of Costa Rica has had the fore-

sight to preserve many unique areas. These present an unparalleled opportunity for the biologist to learn more about this marvelously complex and beautiful country.

Finally, we wish to thank Mr. James Cokendolpher for his many helpful suggestions in editing this manuscript.

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